Proofs for file C:\Escher\Customers\prang-cpp\prang.cpp

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Escher Verification Studio file versions

EscherTool 7.00
ecv 7.00.00.00
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Proved 167 of 174 verification conditions.

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (58,22)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[from term 5.0, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < 0

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (58,22)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 3 of conjunction in term 2.46]

[4.0] -30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[from term 4.0, literala* < −**this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1 is*

true whenever (-1 + literala) < -30269]

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -30269

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (58,31)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.a1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.a1

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{funcstart_790,1}$.a1

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.a1

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[1.3] -32768 ≤ **asType**<**short int**>((**int**)177)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (58,31)

Condition defined at:

To prove: $heap$_{funcstart_790,1}$.a1 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

Proof:

[Take goal term]

[1.0] $\$heap_{funcstart_790,1}$.a1 $\leq$ **maxof**(**int**)

$\rightarrow$ *[const static or extern object]*

[1.1] $\$heap_{init}$.a1 $\leq$ **maxof**(**int**)

$\rightarrow$ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[1.2] **asType**<**short int**>((**int**)177) $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.6] **true**

Proof of verification condition: Precondition of 'div' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (58,18)

Condition defined at: C:\Escher\ecv\standard\stdlib.h (94,10)

To prove: 0 < **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

Proof:

[Take goal term]

[1.0] 0 < **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[1.1] 0 < **asType<integer>**(**asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[1.2] 0 < **asType<integer>**(**asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[1.7] **true**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (59,48)

To prove: (**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType<short int>**((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] (**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[const static or extern object]*

[1.1] (**asType**<**integer**>($\$heap_{init}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[1.2] (**asType**<**integer**>(**asType**<**short int**>((**int**)177)) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[simplify]*

[1.5] (177 ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.6] (177 ≤ **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[simplify]*

[1.9] (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => !(0 == **asType**<**integer**>(div1.quot))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.10] (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[simplify]*

[1.14] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∨ (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[negate goal and search for contradiction]*

[1.15] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∧ !(-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[simplify]*

[1.18] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∧ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[separate conjunction and work on first sub-term]*

[1.19] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

→ *[from term 1.19, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is equal to 0]*

[11.18] 0 == (−0 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

→ *[simplify]*

[11.20] 0 == (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177)

[Work on sub-term 2 of conjunction in term 1.18]

[22.0] 176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Create new term from term 11.20 using rule: condition for equality of division]

[23.0] ((0 * 177) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1)))

→ *[simplify]*

[23.3] (-1 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1)))

→ *[from term 22.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 is true whenever (-1 + literala) < 176]*

Proof of rule precondition:

[23.3.0] (-1 + -1) < 176

→ *[simplify]*

[23.3.2] **true**

[23.4] **true** ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1)))

→ *[simplify]*

[23.9] **true** ∧ (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[from term 22.0, literala <* −**this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1*

is false whenever -2 < (176 + literala)]

Proof of rule precondition:

[23.9.0] -2 < (-177 + 176)

→ *[simplify]*

[23.9.2] **true**

[23.10] **true** ∧ **false**

→ *[simplify]*

[23.11] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (59,20)

To prove: (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[1.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[const static or extern object]*

[1.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType<integer>**($heap$_{init}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[1.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)177))) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[1.10] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.11] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[1.12] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.13] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[1.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[negate goal and search for contradiction]*

[1.20] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∧ !(176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[simplify]*

[1.22] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∧ (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[separate conjunction and work on first sub-term]*

[1.23] -177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177))

[Work on sub-term 2 of conjunction in term 1.22]

[21.0] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))

[Copy term 21.0]

[22.0] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 12.17, div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem is equal to **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177]*

[22.1] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177)))

→ *[remainder with larger divisor]*

Proof of rule precondition 1:

[22.1.0.0] literald < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1

→ *[unify with term 1.23]*

[22.1.0.1] **true**

Proof of rule precondition 2:

[22.1.1.0] literalc < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[unify with term 5.0]*

[22.1.1.1] **true**

Proof of rule precondition 3:

[22.1.2.0] −-177 ≤ 177

→ *[simplify]*

[22.1.2.2] **true**

Proof of rule precondition 4:

[22.1.3.0] -2 < 0

→ *[simplify]*

[22.1.3.1] **true**

[22.2] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[22.5] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (60,26)

To prove: !(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 <

asType<integer>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] !(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) || !(0 == **asType**<**integer**>(div1.quot))

→ *[simplify]*

[1.2] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) || !(0 == **asType**<**integer**>(div1.quot))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.3] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) || !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[simplify]*

[1.5] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∨ !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[negate goal and search for contradiction]*

[1.6] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∧ (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[separate conjunction and work on first sub-term]*

[1.7] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Work on sub-term 2 of conjunction in term 1.6]

[23.0] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Take given term]

[21.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[const static or extern object]*

[21.3] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 < **asType**<**integer**>($\$heap_{init}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[21.4] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)177))) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.10] (-177 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[21.11] (-177 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.12] (-177 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) => (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.13] (-177 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) => (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1))

→ *[simplify]*

[21.19] (0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)

→ *[from term 23.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to 0]*

[21.20] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + 0)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[simplify]*

[21.21] (0 == −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[from term 5.0, −***this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 == literala is false whenever -1 < (0 + literala)]*

Proof of rule precondition:

[21.21.0] -1 < (0 + 0)

→ *[simplify]*

[21.21.2] **true**

[21.22] **false** ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[simplify]*

[21.23] 176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[22.0] (**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[const static or extern object]*

[22.1] (**asType**<**integer**>($heap$_{init}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[22.2] (**asType**<**integer**>(**asType**<**short int**>((**int**)177)) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[simplify]*

[22.5] (177 ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[22.6] (177 ≤ **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) => !(0 == **asType**<**integer**>(div1.quot))

→ *[simplify]*

[22.9] (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => !(0 ==

asType<integer>(div1.quot))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[22.10] (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => !(0 == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[simplify]*

[22.14] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∨ (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

→ *[from term 21.23, literala < −***this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1 is false whenever -2 < (176 + literala)]*

Proof of rule precondition:

[22.14.0] -2 < (-177 + 176)

→ *[simplify]*

[22.14.2] **true**

[22.15] **false** ∨ !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 1.7, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is equal to 0]*

[22.16] **false** ∨ !(0 == 0)

→ *[simplify]*

[22.19] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (62,22)

Condition defined at:

To prove: minof(**int**) ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1)) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

→ *[from term 6.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < 0

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (62,22)

Condition defined at:

To prove: **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2 $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <

$-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[Dereference address-of object]*

[2.35] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[simplify]*

[2.36] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[const static or extern object]*

[2.37] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{init}$.M3))

$\rightarrow$ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

$\rightarrow$ *[simplify]*

[2.46] (-30323 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 2 of conjunction in term 2.46]

[3.0] -30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

→ *[from term 3.0, literala* < −**this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2 is true whenever (-1 + literala) < -30307]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -30307

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (62,31)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.a2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ $\$heap_{funcstart_790,1}$.a2

→ *[simplify]*

[1.1] -32768 ≤ $\$heap_{funcstart_790,1}$.a2

→ *[const static or extern object]*

[1.2] -32768 ≤ $\$heap_{init}$.a2

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[1.3] -32768 ≤ **asType**<**short int**>((**int**)176)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (62,31)

Condition defined at:

To prove: $\$heap_{funcstart_790,1}$.a2 $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0

== **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take goal term]

[1.0] $heap$_{funcstart_790,1}$.a2 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.a2 ≤ **maxof**(**int**)

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[1.2] **asType**<**short int**>((**int**)176) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Precondition of 'div' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (62,18)

Condition defined at: C:\Escher\ecv\standard\stdlib.h (94,10)

To prove: 0 < **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

Proof:

[Take goal term]

[1.0] 0 < **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[1.1] 0 < **asType**<**integer**>(**asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[1.2] 0 < **asType**<**integer**>(**asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[1.7] **true**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (63,48)

To prove: (**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p2), **asType<int>**($\$heap_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($\$heap_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take goal term]

[1.0] (**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0
== **asType**<**integer**>(div2.quot))

→ *[const static or extern object]*

[1.1] (**asType**<**integer**>($heap$_{init}$.a2) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0
== **asType**<**integer**>(div2.quot))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[1.2] (**asType**<**integer**>(**asType**<**short int**>((**int**)176)) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0
== **asType**<**integer**>(div2.quot))

→ *[simplify]*

[1.5] (176 ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.6] (176 ≤ **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) => !(0 == **asType<integer>**(div2.quot))

→ *[simplify]*

[1.9] (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => !(0 == **asType<integer>**(div2.quot))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.10] (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => !(0 == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[simplify]*

[1.14] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ∨ (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[negate goal and search for contradiction]*

[1.15] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ∧ !(-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[simplify]*

[1.18] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ∧ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[separate conjunction and work on first sub-term]*

[1.19] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

→ *[from term 1.19, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot is equal to 0]*

[27.18] 0 == (−0 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

→ *[simplify]*

[27.20] 0 == (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176)

[Work on sub-term 2 of conjunction in term 1.18]

[38.0] 175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Create new term from term 27.20 using rule: condition for equality of division]

[42.0] ((0 * 176) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1)))

→ *[simplify]*

[42.3] (-1 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1)))

→ *[from term 38.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 is true whenever (-1 + literala) < 175]*

Proof of rule precondition:

[42.3.0] (-1 + -1) < 175

→ *[simplify]*

[42.3.2] **true**

[42.4] **true** ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1)))

→ *[simplify]*

[42.9] **true** ∧ (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[from term 38.0, literala <* −**this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2*

is false whenever -2 < (175 + literala)]

Proof of rule precondition:

[42.9.0] -2 < (-176 + 175)

→ *[simplify]*

[42.9.2] **true**

[42.10] **true** ∧ **false**

→ *[simplify]*

[42.11] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (63,20)

To prove: (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take goal term]

[1.0] (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[1.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[const static or extern object]*

[1.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[1.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)176))) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[1.10] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.11] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[1.12] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.13] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))

→ *[simplify]*

[1.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[negate goal and search for contradiction]*

[1.20] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∧ !(175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[simplify]*

[1.22] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∧ (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[separate conjunction and work on first sub-term]*

[1.23] -176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2 % 176))

[Work on sub-term 2 of conjunction in term 1.22]

[37.0] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

[Copy term 37.0]

[41.0] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 28.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 % 176]*

[41.1] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 % 176)))

→ *[remainder with larger divisor]*

Proof of rule precondition 1:

[41.1.0.0] literald < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 1.23]*

[41.1.0.1] **true**

Proof of rule precondition 2:

[41.1.1.0] literalc < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 6.0]*

[41.1.1.1] **true**

Proof of rule precondition 3:

[41.1.2.0] −-176 ≤ 176

→ *[simplify]*

[41.1.2.2] **true**

Proof of rule precondition 4:

[41.1.3.0] -2 < 0

→ *[simplify]*

[41.1.3.1] **true**

[41.2] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))

→ *[simplify]*

[41.5] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (64,26)

To prove: !(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤

asType<integer>(operator*(heapIs $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>(asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>(asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>(asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>(asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take goal term]

[1.0] !(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) || !(0 ==

asType<**integer**>(div2.quot))

→ *[simplify]*

[1.2] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) || !(0 == **asType**<**integer**>(div2.quot))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.3] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) || !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[simplify]*

[1.5] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ∨ !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[negate goal and search for contradiction]*

[1.6] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ∧ (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[separate conjunction and work on first sub-term]*

[1.7] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Work on sub-term 2 of conjunction in term 1.6]

[39.0] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Take given term]

[37.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[const static or extern object]*

[37.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[37.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)176))) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.10] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[37.11] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.12] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.13] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))

→ *[simplify]*

[37.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[from term 39.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to 0]*

[37.20] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + 0)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[simplify]*

[37.21] (0 == −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[from term 6.0, −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 == literala is false whenever -1 < (0 + literala)]*

Proof of rule precondition:

[37.21.0] -1 < (0 + 0)

→ *[simplify]*

[37.21.2] **true**

[37.22] **false** ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

→ *[simplify]*

[37.23] 175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[38.0] (**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

→ *[const static or extern object]*

[38.1] (**asType**<**integer**>($heap$_{init}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[38.2] (**asType**<**integer**>(**asType**<**short int**>((**int**)176)) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

→ *[simplify]*

[38.5] (176 ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[38.6] (176 ≤ **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) => !(0 == **asType**<**integer**>(div2.quot))

→ *[simplify]*

[38.9] (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => !(0 == **asType**<**integer**>(div2.quot))

→ *[from term 24.7, div2 is equal to div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)]*

[38.10] (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).quot))

→ *[simplify]*

[38.14] !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) ∨ (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)

→ *[from term 37.23, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 is false whenever -2 < (175 + literala)]*

Proof of rule precondition:

[38.14.0] -2 < (-176 + 175)

→ *[simplify]*

[38.14.2] **true**

[38.15] **false** ∨ !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 1.7, div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot is equal to 0]*

[38.16] **false** ∨ !(0 == 0)

→ *[simplify]*

[38.19] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (66,22)

Condition defined at:

To prove: **minof**(**int**) ≤ **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <

asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[from term 7.0, literala <* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < 0

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (66,22)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[2.47] -30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[from term 2.47, literala* < −**this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3*

is true whenever (-1 + literala) < -30323]

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -30323

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (66,31)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.a3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.a3

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{funcstart_790,1}$.a3

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.a3

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[1.3] -32768 ≤ **asType**<**short int**>((**int**)178)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (66,31)

Condition defined at:

To prove: $heap$_{funcstart_790,1}$.a3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

Proof:

[Take goal term]

[1.0] $heap$_{funcstart_790,1}$.a3 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.a3 ≤ **maxof**(**int**)

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[1.2] **asType**<**short int**>((**int**)178) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Precondition of 'div' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (66,18)

Condition defined at: C:\Escher\ecv\standard\stdlib.h (94,10)

To prove: 0 < **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤

asType<integer>(operator*(heapIs $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>(asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>(asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>(asType<int>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>(asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

Proof:

[Take goal term]

[1.0] 0 < **asType<integer>(asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[1.1] 0 < **asType<integer>(asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[1.2] 0 < **asType<integer>(asType<int>(asType<short int>((int)**178)))

→ *[simplify]*

[1.7] **true**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (67,48)

To prove: (**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take goal term]

[1.0] (**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

→ *[const static or extern object]*

[1.1] (**asType**<**integer**>($heap$_{init}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[1.2] (**asType**<**integer**>(**asType**<**short int**>((**int**)178)) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

→ *[simplify]*

[1.5] (178 ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.6] (178 ≤ **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) => !(0 == **asType**<**integer**>(div3.quot))

→ *[simplify]*

[1.9] (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => !(0 == **asType**<**integer**>(div3.quot))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.10] (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => !(0 == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[simplify]*

[1.14] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ∨ (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[negate goal and search for contradiction]*

[1.15] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ∧ !(-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[simplify]*

[1.18] (0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ∧ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[1.19] 0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType<integer>**(178)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

→ *[from term 1.19, div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot is equal to 0]*

[43.18] 0 == (−0 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

→ *[simplify]*

[43.20] 0 == (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)

[Work on sub-term 2 of conjunction in term 1.18]

[54.0] 177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Create new term from term 43.20 using rule: condition for equality of division]

[61.0] ((0 * 178) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1)))

→ *[simplify]*

[61.3] (-1 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1)))

→ *[from term 54.0, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3 is true whenever (-1 + literala) < 177]*

Proof of rule precondition:

[61.3.0] (-1 + -1) < 177

→ *[simplify]*

[61.3.2] **true**

[61.4] **true** ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1)))

→ *[simplify]*

[61.9] **true** ∧ (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[from term 54.0, literala <* −**this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3 is false whenever -2 < (177 + literala)]*

Proof of rule precondition:

[61.9.0] -2 < (-178 + 177)

→ *[simplify]*

[61.9.2] **true**

[61.10] **true** ∧ **false**

→ *[simplify]*

[61.11] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (67,20)

To prove: (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178)

[Take goal term]

[1.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[1.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[const static or extern object]*

[1.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.a3)) => (**asType**<**integer**>(div3.rem) ==
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[1.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)178))) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[1.10] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.11] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) =>
(**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem) ==
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[1.12] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) =>
(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.13] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) =>
(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem ==
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))

→ *[simplify]*

[1.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))
∨ (177 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

→ *[negate goal and search for contradiction]*

[1.20] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))
∧ !(177 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

→ *[simplify]*

[1.22] !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))
∧ (-178 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[1.23] -178 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Work on sub-term 2 of conjunction in term 1.22]

[53.0] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Copy term 53.0]

[60.0] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 44.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 % 178]*

[60.1] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)))

→ *[remainder with larger divisor]*

Proof of rule precondition 1:

[60.1.0.0] literald < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 1.23]*

[60.1.0.1] **true**

Proof of rule precondition 2:

[60.1.1.0] literalc < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 7.0]*

[60.1.1.1] **true**

Proof of rule precondition 3:

[60.1.2.0] −-178 ≤ 178

→ *[simplify]*

[60.1.2.2] **true**

Proof of rule precondition 4:

[60.1.3.0] -2 < 0

→ *[simplify]*

[60.1.3.1] **true**

[60.2] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))

→ *[simplify]*

[60.5] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (68,26)

To prove: !(0 == **asType<integer>**(div3.rem)) || !(0 ==

asType<integer>(div3.quot))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType<short int>**((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <

asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178)

[Take goal term]

[1.0] !(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[1.1] !(0 == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) || !(0 == **asType**<**integer**>(div3.quot))

→ *[simplify]*

[1.2] !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) || !(0 == **asType**<**integer**>(div3.quot))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[1.3] !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) || !(0 == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot))

→ *[simplify]*

[1.5] !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) ∨ !(0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[negate goal and search for contradiction]*

[1.6] (0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) ∧ (0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[separate conjunction and work on first sub-term]*

[1.7] 0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot

[Work on sub-term 2 of conjunction in term 1.6]

[55.0] 0 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem

[Take given term]

[53.0] (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a3)) =>

(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[const static or extern object]*

[53.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[53.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)178))) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.10] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[53.11] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.12] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.13] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem ==
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))

→ *[simplify]*

[53.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[from term 55.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to 0]*

[53.20] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + 0)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[simplify]*

[53.21] (0 == −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[from term 7.0, −***this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 == literala is false whenever -1 < (0 + literala)]*

Proof of rule precondition:

[53.21.0] -1 < (0 + 0)

→ *[simplify]*

[53.21.2] **true**

[53.22] **false** ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[simplify]*

[53.23] 177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[54.0] (**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

→ *[const static or extern object]*

[54.1] (**asType<integer>**($heap$_{init}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[54.2] (**asType<integer>**(**asType<short int>**((**int**)178)) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

→ *[simplify]*

[54.5] (178 ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p3)) => !(0 == **asType<integer>**(div3.quot))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[54.6] (178 ≤ **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) => !(0 == **asType<integer>**(div3.quot))

→ *[simplify]*

[54.9] (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => !(0 == **asType<integer>**(div3.quot))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[54.10] (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => !(0 == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[simplify]*

[54.14] !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ∨ (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[from term 53.23, literala < −***this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 is false whenever -2 < (177 + literala)]*

Proof of rule precondition:

[54.14.0] -2 < (-178 + 177)

→ *[simplify]*

[54.14.2] **true**

[54.15] **false** ∨ !(0 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 1.7, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is equal to 0]*

[54.16] **false** ∨ !(0 == 0)

→ *[simplify]*

[54.19] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,15)

Condition defined at:

To prove: minof(**short int**) $\leq$ div1.rem

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Assume known post-assertion, class invariant or type constraint for term 12.17]

[19.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[simplify]*

[19.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Take goal term]

[1.0] **minof**(**short int**) ≤ div1.rem

→ *[simplify]*

[1.1] -32768 $\leq$ div1.rem

$\rightarrow$ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

$\rightarrow$ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

$\rightarrow$ *[from term 19.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

$\rightarrow$ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,15)

Condition defined at:

To prove: div1.rem $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<integer>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) %
asType<**integer**>(177)) == **asType**<**integer**>(div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) ==
asType<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is*

false whenever -2 < (0 + literala)]

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Assume known post-assertion, class invariant or type constraint for term 12.17]

[20.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem ≤ **maxof**(**int**)

→ *[simplify]*

[20.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Take goal term]

[1.0] div1.rem ≤ **maxof**(**short int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[from term 20.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,15)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **asType**<**short int**>(div1.rem)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0

== **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Assume known post-assertion, class invariant or type constraint for term 12.17]

[19.0] **minof**(**int**) $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

$\rightarrow$ *[simplify]*

[19.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Take goal term]

[1.0] **minof**(**int**) $\leq$ **asType**<**short int**>(div1.rem)

$\rightarrow$ *[simplify]*

[1.1] -32768 $\leq$ **asType**<**short int**>(div1.rem)

$\rightarrow$ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 $\leq$ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

$\rightarrow$ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

$\rightarrow$ *[from term 19.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

$\rightarrow$ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,15)

Condition defined at:

To prove: **asType**<**short int**>(div1.rem) $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177))

[Assume known post-assertion, class invariant or type constraint for term 12.17]

[20.0] div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem ≤ **maxof**(**int**)

→ *[simplify]*

[20.9] -32768 < −div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem

[Take goal term]

[1.0] **asType**<**short int**>(div1.rem) ≤ **maxof**(**int**)

→ *[from term 8.7, div1 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)]*

[1.1] **asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[from term 20.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,10)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.r1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) ==

asType<integer>(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take goal term]

[1.0] **minof(int)** ≤ $heap$_{funcstart_790,1}$.r1

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{funcstart_790,1}$.r1

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.r1

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.3] -32768 ≤ **asType<short int>**((**int**)171)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,10)

Condition defined at:

To prove: $heap$_{funcstart_790,1}$.r1 ≤ **maxof(int)**

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) ==

asType<integer>(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take goal term]

[1.0] $heap$_{funcstart_790,1}$.r1 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.r1 ≤ **maxof**(**int**)

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.2] **asType<short int>**((**int**)171) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Arithmetic result of operator '*' is within

limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,13)

Condition defined at:

To prove: **minof**(**int**) $\leq$ (**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1))

→ *[const static or extern object]*

[1.5] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.6] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171)))

→ *[simplify]*

[1.11] -32769 < (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[literal comparison of product]*

[1.12] ([171 < 0]: (-32769 / -171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [0 < 171]: (-32769 / 171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [0 == 171]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.13] ([171 < 0]: (-32769 / -171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(0 < 171) ∧ !(171 < 0)]: (-32769 / 171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(0 == 171) ∧ !(0 < 171) ∧ !(171 < 0)]: -32769 < 0)

→ *[simplify]*

[1.21] -192 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[negate goal and search for contradiction]*

[1.22] !(-192 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[1.24] 191 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Create new term from terms 1.24, 12.17 using rule: transitivity 15]

[66.0] (0 + 191) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)

→ *[simplify]*

[66.2] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,13)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType<int>**($\$heap_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($\$heap_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType<int>**($\$heap_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) ==

asType<integer>(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div1.rem)) *
asType<**int**>($heap$_{funcstart_790,1}$.r1)) ≤ **maxof**(**int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *
asType<**int**>($heap$_{funcstart_790,1}$.r1)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) ≤

maxof(**int**)

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.5] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.18] -32768 < (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[literal comparison of product]*

[1.19] ([-171 < 0]: (-32768 / 171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [0 < -171]: (-32768 / -171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [-171 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.20] ([-171 < 0]: (-32768 / 171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(0 < -171) ∧ !(-171 < 0)]: (-32768 / -171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(-171 == 0) ∧ !(-171 < 0) ∧ !(0 < -171)]: -32768 < 0)

→ *[simplify]*

[1.24] -192 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[negate goal and search for contradiction]*

[1.25] !(-192 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[1.28] 191 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

→ *[remainder is less than divisor]*

Proof of rule precondition:

[12.17.0] (177 + −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) ≤ 0

→ *[simplify]*

[12.17.11] 176 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[from term 1.28, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is true whenever (-1 + literala) < 191]*

Proof of rule precondition:

[12.17.11.0] (-1 + 176) < 191

→ *[simplify]*

[12.17.11.2] **true**

[12.17.12] **true**

[12.18] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,40)

Condition defined at:

To prove: minof(**short int**) $\leq$ div1.quot

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 11.17]

[17.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[simplify]*

[17.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Take goal term]

[1.0] **minof**(**short int**) ≤ div1.quot

→ *[simplify]*

[1.1] -32768 $\leq$ div1.quot

$\rightarrow$ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

$\rightarrow$ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

$\rightarrow$ *[from term 17.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

$\rightarrow$ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,40)

Condition defined at:

To prove: div1.quot $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<integer>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) /
asType<**integer**>(177)) == **asType**<**integer**>(div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) ==
asType<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is*

false whenever -2 < (0 + literala)]

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 11.17]

[18.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot ≤ **maxof**(**int**)

→ *[simplify]*

[18.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Take goal term]

[1.0] div1.quot ≤ **maxof**(**short int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[from term 18.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,40)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **asType**<**short int**>(div1.quot)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0

== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator '/' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 11.17]

[17.0] **minof**(**int**) $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

$\rightarrow$ *[simplify]*

[17.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Take goal term]

[1.0] **minof**(**int**) $\leq$ **asType**<**short int**>(div1.quot)

$\rightarrow$ *[simplify]*

[1.1] -32768 $\leq$ **asType**<**short int**>(div1.quot)

$\rightarrow$ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 $\leq$ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

$\rightarrow$ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

$\rightarrow$ *[from term 17.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

$\rightarrow$ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,40)

Condition defined at:

To prove: **asType**<**short int**>(div1.quot) $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 11.17]

[18.0] div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot ≤ **maxof**(**int**)

→ *[simplify]*

[18.9] -32768 < −div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot

[Take goal term]

[1.0] **asType**<**short int**>(div1.quot) ≤ **maxof**(**int**)

→ *[from term 8.7, div1 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)]*

[1.1] **asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[from term 18.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,35)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.b1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) ==

asType<integer>(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{funcstart_790,1}$.b1

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{funcstart_790,1}$.b1

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.b1

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.3] -32768 ≤ **asType<short int>**((**int**)2)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,35)

Condition defined at:

To prove: $heap$_{funcstart_790,1}$.b1 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) ==

asType<integer>(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take goal term]

[1.0] $heap$_{funcstart_790,1}$.b1 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.b1 ≤ **maxof**(**int**)

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.2] **asType<short int>**((**int**)2) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Arithmetic result of operator '*' is within

limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,38)

Condition defined at:

To prove: **minof**(**int**) $\leq$ (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))

→ *[const static or extern object]*

[1.5] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.6] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2)))

→ *[simplify]*

[1.11] -32769 < (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[literal comparison of product]*

[1.12] ([2 < 0]: (-32769 / -2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 < 2]: (-32769 / 2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 == 2]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.13] ([2 < 0]: (-32769 / -2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 < 2) ∧ !(2 < 0)]: (-32769 / 2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 == 2) ∧ !(0 < 2) ∧ !(2 < 0)]: -32769 < 0)

→ *[simplify]*

[1.21] -16385 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[negate goal and search for contradiction]*

[1.22] !(-16385 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[1.24] 16384 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Create new term from terms 1.24, 11.17 using rule: transitivity 15]

[65.0] (0 + 16384) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177)

→ *[simplify]*

[65.7] 2899968 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[65.7.0] -2 < (0 + 2899968)

→ *[simplify]*

[65.7.2] **true**

[65.8] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,38)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<integer>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *
asType<**int**>($heap$_{funcstart_790,1}$.b1)) ≤ **maxof**(**int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.5] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.18] -32768 < (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[literal comparison of product]*

[1.19] ([-2 < 0]: (-32768 / 2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 < -2]: (-32768 / -2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [-2 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.20] ([-2 < 0]: (-32768 / 2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 < -2) ∧ !(-2 < 0)]: (-32768 / -2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(-2 == 0) ∧ !(-2 < 0) ∧ !(0 < -2)]: -32768 < 0)

→ *[simplify]*

[1.24] -16384 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[negate goal and search for contradiction]*

[1.25] !(-16384 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[1.28] 16383 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Create new term from terms 1.28, 11.17 using rule: transitivity 16]

[65.0] (0 + 16383) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177)

→ *[simplify]*

[65.8] 2899967 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Work on sub-term 3 of conjunction in term 2.46]

[4.0] -30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[from term 65.8, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (2899967 + literala)]*

Proof of rule precondition:

[4.0.0] -2 < (-30269 + 2899967)

→ *[simplify]*

[4.0.2] **true**

[4.1] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,33)

Condition defined at:

To prove: **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

[Work on sub-term 3 of conjunction in term 2.46]

[4.0] -30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[simplify]*

[1.1] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.2] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[simplify]*

[1.4] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[const static or extern object]*

[1.5] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) −

(**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.6] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[simplify]*

[1.9] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.10] -32768 ≤ ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[simplify]*

[1.12] -32768 ≤ ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))

→ *[const static or extern object]*

[1.13] -32768 ≤ ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.14] -32768 ≤ ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))

→ *[simplify]*

[1.21] -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[negate goal and search for contradiction]*

[1.22] !(-32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[simplify]*

[1.27] 32768 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) %

177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Copy term 1.27]

[72.0] 32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[from term 12.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 % 177]*

[72.1] 32768 < ((-171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Create new term from term 11.17 using rule: condition for equality of division]

[75.0] ((177 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))))

→ *[simplify]*

[75.15] (-1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (-177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

[Work on sub-term 2 of conjunction in term 75.15]

[76.0] -1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

[Create new term from terms 76.0, 4.0 using rule: transitivity 2]

[115.0] (-30269 + -1 + 1) < (-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[115.1] -30269 < (-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[literal comparison of product]*

[115.2] ([-177 < 0]: (-30269 / 177) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 < -177]: (-30269 / -177) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [-177 == 0]: -30269 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[115.3] ([-177 < 0]: (-30269 / 177) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 < -177) ∧ !(-177 < 0)]: (-30269 / -177) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(-177 == 0) ∧ !(-177 < 0) ∧ !(0 < -177)]: -30269 < 0)

→ *[simplify]*

[115.7] -172 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Create new term from terms 115.7, 72.1 using rule: transitivity 5]

[137.0] 32768 < ((-171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)) + (2 * −(-172 + 1)))

→ *[simplify]*

[137.5] 32426 < (-171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

→ *[literal comparison of product]*

[137.6] ([-171 < 0]: (32426 / 171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [0 < -171]: (32426 / -171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [-171 == 0]: 32426 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[137.7] ([-171 < 0]: (32426 / 171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(0 < -171) ∧ !(-171 < 0)]: (32426 / -171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(-171 == 0) ∧ !(-171 < 0) ∧ !(0 < -171)]: 32426 < 0)

→ *[simplify]*

[137.12] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at:

C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (72,33)

Condition defined at:

To prove: ((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take goal term]

[1.0] ((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.1] ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.4] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[1.5] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.8] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[1.9] ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.11] ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.12] ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[1.13] ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2)))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.32] -32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[negate goal and search for contradiction]*

[1.33] !(-32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[simplify]*

[1.38] 32767 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) / 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % **asType<integer>**(177)) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177)

== **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Take given term]

[21.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[const static or extern object]*

[21.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[21.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)177))) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.10] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[21.11] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) ==

asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.12] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.13] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[21.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

[Branch on disjunction or conditional in term 21.19]

[56.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Copy term 1.38]

[57.0] (32767 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 56.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1]*

[57.1] (32767 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))) ∨ ...

[Copy term 12.17]

[58.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 56.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1]*

[58.1] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 58.1]

[59.0] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < 177) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[simplify]*

[59.3] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ ...

[Create new term from terms 57.1, 59.3 using rule: transitivity 5r]

[66.0] (32767 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * −(-177 + 1)))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[simplify]*

[66.5] (2671 < (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) ∨ ...

→ *[literal comparison of product]*

[66.6] ([-2 < 0]: (2671 / 2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 < -2]: (2671 / -2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [-2 == 0]: 2671 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[66.7] ([-2 < 0]: (2671 / 2) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 < -2) ∧ !(-2 < 0)]: (2671 / -2) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(-2 == 0) ∧ !(-2 < 0) ∧ !(0 < -2)]: 2671 < 0) ∨ ...

→ *[simplify]*

[66.11] (1335 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∨ ...

[Create new term from terms 66.11, 11.17 using rule: transitivity 15]

[68.0] ((0 + 1335) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

$\vee$ (176 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\vee$!(0 == ($-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

$\rightarrow$ *[simplify]*

[68.1] (1335 $<$ $-$(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177)) $\vee$ ...

$\rightarrow$ *[division by larger divisor]*

Proof of rule precondition 1:

[68.1.0.0] literald $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

$\rightarrow$ *[unify with term 59.3]*

[68.1.0.1] **true**

Proof of rule precondition 2:

[68.1.1.0] literalc $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

$\rightarrow$ *[unify with term 5.0]*

[68.1.1.1] **true**

Proof of rule precondition 3:

[68.1.2.0] $-$-177 $\leq$ 177

$\rightarrow$ *[simplify]*

[68.1.2.2] **true**

Proof of rule precondition 4:

[68.1.3.0] -2 $<$ 0

$\rightarrow$ *[simplify]*

[68.1.3.1] **true**

[68.2] (1335 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\vee$ ...

$\rightarrow$ *[from term 5.0, literala $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 $<$ (0 + literala)]*

Proof of rule precondition:

[68.2.0] -2 $<$ (0 + 1335)

$\rightarrow$ *[simplify]*

[68.2.2] **true**

[68.3] **false** $\vee$ ...

[Remove 'false' term 68.3 and fetch new term from containing clause]

[69.0] 176 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Copy term 1.38]

[72.0] 32767 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 12.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 % 177]*

[72.1] 32767 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)))

[Create new term from term 11.17 using rule: condition for equality of division]

[75.0] ((177 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))))

→ *[simplify]*

[75.15] (-1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (-177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[separate conjunction and work on first sub-term]*

[75.16] -177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Create new term from terms 69.0, 75.16 using rule: transitivity 3]

[77.0] (-177 + 1 + 176) < (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[77.1] 0 < (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[product is positive]*

[77.2] ((0 < 177) ∧ (0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) ∨ ((177 < 0) ∧ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot < 0))

→ *[simplify]*

[77.7] 0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Create new term from terms 77.7, 72.1 using rule: transitivity 11]

[82.0] (1 + 32767 + (0 * 2)) < (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

→ *[simplify]*

[82.2] 32768 < (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

→ *[literal comparison of product]*

[82.3] ([171 < 0]: (32768 / -171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [0 < 171]: (32768 / 171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [0 == 171]: 32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[82.4] ([171 < 0]: (32768 / -171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(0 < 171) ∧ !(171 < 0)]: (32768 / 171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(0 == 171) ∧ !(0 < 171) ∧ !(171 < 0)]: 32768 < 0)

→ *[simplify]*

[82.13] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (73,31)

To prove: **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) %

177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))

[Assume known post-assertion, class invariant or type constraint for term 11.17]

[17.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

→ *[simplify]*

[17.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot

[Take given term]

[21.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[const static or extern object]*

[21.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[21.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)177))) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.10] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[21.11] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[simplify]*

[21.12] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[21.13] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[21.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short
int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short
int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.1] **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1,
177).rem))), **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[simplify]*

[1.8] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.9] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1)

→ *[const member of object with modified fields]*

[1.10] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1)

→ *[const static or extern object]*

[1.11] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{init}$.M1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.12] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30269))

→ *[simplify]*

[1.22] -30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[negate goal and search for contradiction]*

[1.23] !(-30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[simplify]*

[1.28] 30268 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Branch on disjunction or conditional in term 21.19]

[59.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Copy term 1.28]

[61.0] (30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 59.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1]*

[61.1] (30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))) ∨ ...

[Copy term 12.17]

[62.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 59.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1]*

[62.1] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 62.1]

[63.0] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < 177) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[simplify]*

[63.3] (-177 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ ...

[Create new term from terms 1.28, 17.3 using rule: transitivity 11r]

[71.0] (1 + 30268 + (-32769 * 2)) < (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[71.2] -35269 < (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[literal comparison of product]*

[71.3] ([171 < 0]: (-35269 / -171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [0 < 171]: (-35269 / 171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [0 == 171]: -35269 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[71.4] ([171 < 0]: (-35269 / -171) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(0 < 171) ∧ !(171 < 0)]: (-35269 / 171) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem, [(0 == 171) ∧ !(0 < 171) ∧ !(171 < 0)]: -35269 < 0)

→ *[simplify]*

[71.12] -207 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Copy term 61.1]

[72.0] (30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))) ∨ (176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 11.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 / 177]*

[72.1] (30268 < ((-2 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177)) + (171 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))) ∨ ...

→ *[division by larger divisor]*

Proof of rule precondition 1:

[72.1.0.0] literald < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[unify with term 63.3]*

[72.1.0.1] **true**

Proof of rule precondition 2:

[72.1.1.0] literalc < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

→ *[unify with term 5.0]*

[72.1.1.1] **true**

Proof of rule precondition 3:

[72.1.2.0] −-177 ≤ 177

→ *[simplify]*

[72.1.2.2] **true**

Proof of rule precondition 4:

[72.1.3.0] -2 < 0

→ *[simplify]*

[72.1.3.1] **true**

[72.2] (30268 < ((-2 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) + (171 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))) ∨ ...

→ *[simplify]*

[72.4] (30268 < (169 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∨ ...

→ *[literal comparison of product]*

[72.5] ([169 < 0]: (30268 / -169) < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, [0 < 169]: (30268 / 169) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, [0 == 169]: 30268 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[72.6] ([169 < 0]: (30268 / -169) < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, [(0 < 169) ∧ !(169 < 0)]: (30268 / 169) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, [(0 == 169) ∧ !(0 < 169) ∧ !(169 < 0)]: 30268 < 0) ∨ ...

→ *[simplify]*

[72.13] (**true** ∧ (179 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∨ ...

→ *[from term 63.3, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1 is false whenever -2 < (-177 + literala)]*

Proof of rule precondition:

[72.13.0] -2 < (-177 + 179)

→ *[simplify]*

[72.13.2] **true**

[72.14] (**true** ∧ **false**) ∨ ...

→ *[simplify]*

[72.15] **false** ∨ ...

[Remove 'false' term 72.15 and fetch new term from containing clause]

[73.0] 176 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Remove 'false' term 72.15 and fetch new term from containing clause]

[74.0] !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Copy term 1.28]

[76.0] 30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 12.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1 % 177]*

[76.1] 30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)))

[Create new term from term 11.17 using rule: condition for equality of division]

[79.0] ((177 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))))

→ *[simplify]*

[79.15] (-1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (-177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[separate conjunction and work on first sub-term]*

[79.16] -177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Create new term from term 74.0 using rule: not-equal implies greater-than or less-than]

[81.0] (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ ((−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) < 0)

→ *[simplify]*

[81.5] (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ (0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

[Branch on disjunction or conditional in term 81.5]

[82.0] (0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∨ (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ !(0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

[Create new term from terms 82.0, 79.16 using rule: transitivity 1]

[83.0] ((-177 + 0 + 1) < (−div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) ∨ (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ !(0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[83.1] (-176 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) ∨ ...

[Create new term from terms 83.1, 71.12 using rule: transitivity 2]

[86.0] ((-207 + -176 + 1) < (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) ∨ (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ !(0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[86.1] (-382 < (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) ∨ ...

→ *[literal comparison of product]*

[86.2] ([177 < 0]: (-382 / -177) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 < 177]: (-382 / 177) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [0 == 177]: -382 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.3] ([177 < 0]: (-382 / -177) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 < 177) ∧ !(177 < 0)]: (-382 / 177) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot, [(0 == 177) ∧ !(0 < 177) ∧ !(177 < 0)]: -382 < 0) ∨ ...

→ *[simplify]*

[86.11] (-3 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) ∨ ...

[Create new term from terms 86.11, 76.1 using rule: transitivity 11]

[91.0] ((1 + 30268 + (-3 * 2)) < (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ (0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ∨ !(0 < (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1))

→ *[simplify]*

[91.2] (30263 < (171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177))) ∨ ...

→ *[literal comparison of product]*

[91.3] ([171 < 0]: (30263 / -171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [0 < 171]: (30263 / 171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [0 == 171]: 30263 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[91.4] ([171 < 0]: (30263 / -171) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(0 < 171) ∧ !(171 < 0)]: (30263 / 171) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177), [(0 == 171) ∧ !(0 < 171) ∧ !(171 < 0)]: 30263 < 0) ∨ ...

→ *[simplify]*

[91.13] **false** ∨ ...

[Remove 'false' term 91.13 and fetch new term from containing clause]

[92.0] 0 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

[Create new term from terms 92.0, 73.0 using rule: transitivity 2]

[96.0] (0 + 1 + 176) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

→ *[simplify]*

[96.1] 177 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem

[Create new term from terms 96.1, 12.17 using rule: transitivity 16]

[97.0] (0 + 177) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)

→ *[simplify]*

[97.2] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp

(73,12)

To prove: $-$**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 3 of conjunction in term 2.46]

[4.0] -30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Work on sub-term 4 of conjunction in term 2.46]

[5.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[11.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / **asType**<**integer**>(177)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[11.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[11.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) /

177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.7.0] -2 < (0 + 0)

→ *[simplify]*

[11.7.2] **true**

[11.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[11.11.0] -2 < (0 + 0)

→ *[simplify]*

[11.11.2] **true**

[11.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) / 177) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[11.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 / 177))

[Assume known post-assertion, class invariant or type constraint for term 8.7]

[12.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) %

asType<integer>(177)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[12.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[12.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.7.0] -2 < (0 + 0)

→ *[simplify]*

[12.7.2] **true**

[12.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) % 177) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) % 177), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[from term 5.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[12.11.0] -2 < (0 + 0)

→ *[simplify]*

[12.11.2] **true**

[12.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) % 177) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)

→ *[simplify]*

[12.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177))

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short
int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short
int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *
asType<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] −**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.1] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const member of object with modified fields]*

[1.2] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const static or extern object]*

[1.3] −**asType**<**integer const**>($heap$_{init}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.4] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30269)) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[simplify]*

[1.8] -30269 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.*__**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*__**replace**(*p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.9] -30269 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.10] -30269 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1)

→ *[evaluate dereferenced pointer into modified heap]*

[1.11] -30269 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.12] -30269 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[simplify]*

[1.16] -30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[negate goal and search for contradiction]*

[1.17] !(-30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[simplify]*

[1.22] 30268 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Copy term 1.22]

[74.0] 30268 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[from term 12.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1 % 177]*

[74.1] 30268 < ((-171 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 % 177)) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Create new term from term 11.17 using rule: condition for equality of division]

[77.0] ((177 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < (177 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))))

→ *[simplify]*

[77.15] (-1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) ∧ (-177 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 + (177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

[Work on sub-term 2 of conjunction in term 77.15]

[78.0] -1 < ((-177 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1)

[Create new term from terms 78.0, 4.0 using rule: transitivity 2]

[117.0] (-30269 + -1 + 1) < (-177 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[simplify]*

[117.1] -30269 < (-177 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

→ *[literal comparison of product]*

[117.2] ([-177 < 0]: (-30269 / 177) < −div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot, [0 < -177]: (-30269 / -177) < div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot, [-177 == 0]: -30269 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.3] ([-177 < 0]: (-30269 / 177) < −div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot, [(0 < -177) ∧ !(-177 < 0)]: (-30269 / -177) < div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot, [(-177 == 0) ∧ !(-177 < 0) ∧ !(0 < -177)]: -30269 < 0)

→ *[simplify]*

[117.7] -172 < −div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot

[Create new term from terms 117.7, 74.1 using rule: transitivity 5]

[139.0] 30268 < ((-171 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177)) + (2 * −(-172 + 1)))

→ *[simplify]*

[139.5] 29926 < (-171 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177))

→ *[literal comparison of product]*

[139.6] ([-171 < 0]: (29926 / 171) < −(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177), [0 < -171]: (29926 / -171) < (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177), [-171 == 0]: 29926 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[139.7] ([-171 < 0]: (29926 / 171) < −(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177), [(0 < -171) ∧ !(-171 < 0)]: (29926 / -171) < (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1 % 177), [(-171 == 0) ∧ !(-171 < 0) ∧ !(0 < -171)]: 29926 < 0)

→ *[simplify]*

[139.12] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,15)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ div2.rem

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) =>

(**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 ==

asType<integer>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2) % 176), [!**false**]:
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Assume known post-assertion, class invariant or type constraint for term 28.17]

[35.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[simplify]*

[35.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Take goal term]

[1.0] **minof**(**short int**) ≤ div2.rem

→ *[simplify]*

[1.1] -32768 ≤ div2.rem

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[from term 35.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,15)

Condition defined at:

To prove: div2.rem $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0

== **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *

asType<int>($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) ==
asType<integer>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) %

176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Assume known post-assertion, class invariant or type constraint for term 28.17]

[36.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem ≤ **maxof**(**int**)

→ *[simplify]*

[36.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Take goal term]

[1.0] div2.rem ≤ **maxof**(**short int**)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[from term 36.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,15)

Condition defined at:

To prove: **minof**(**int**) ≤ **asType**<**short int**>(div2.rem)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <

asType<integer>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <

$-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[simplify]*

[2.36] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[const static or extern object]*

[2.37] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{init}$.M3))

$\rightarrow$ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

$\rightarrow$ *[simplify]*

[2.46] (-30323 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

$\rightarrow$ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) %

176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Assume known post-assertion, class invariant or type constraint for term 28.17]

[35.0] **minof**(**int**) $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[simplify]*

[35.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Take goal term]

[1.0] **minof**(**int**) $\leq$ **asType**<**short int**>(div2.rem)

→ *[simplify]*

[1.1] -32768 $\leq$ **asType**<**short int**>(div2.rem)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 $\leq$ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[from term 35.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,15)

Condition defined at:

To prove: **asType**<**short int**>(div2.rem) $\leq$ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) ==

asType<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>($\$heap_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Assume known post-assertion, class invariant or type constraint for term 28.17]

[36.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem ≤ **maxof**(**int**)

→ *[simplify]*

[36.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem

[Take goal term]

[1.0] **asType<short int>**(div2.rem) $\leq$ **maxof**(**int**)

$\rightarrow$ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[1.1] **asType<short int>**(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.11] -32768 < $-$div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem

$\rightarrow$ *[from term 36.9, literala < $-$div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176).rem is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

$\rightarrow$ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,10)

Condition defined at:

To prove: **minof**(**int**) $\leq$ $\$heap_{790,1;808,8}$.r2

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),

asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($\$heap_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ $\$heap_{790,1;808,8}$.r2

→ *[simplify]*

[1.1] -32768 ≤ $\$heap_{790,1;808,8}$.r2

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[1.2] -32768 ≤ $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2

→ *[const member of object with modified fields]*

[1.3] -32768 ≤ $\$heap_{funcstart_790,1}$.r2

→ *[const static or extern object]*

[1.4] -32768 ≤ $\$heap_{init}$.r2

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.5] -32768 ≤ **asType**<**short int**>((**int**)172)

→ *[simplify]*

[1.8] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,10)

Condition defined at:

To prove: $\$heap_{790,1;808,8}$.r2 $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) =>

(**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 ==

asType<integer>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] $heap$_{790,1;808,8}$.r2 ≤ **maxof**(**int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.1] $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2 ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.2] $heap$_{funcstart_790,1}$.r2 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.3] $heap$_{init}$.r2 ≤ **maxof**(**int**)

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.4] **asType**<**short int**>((**int**)172) ≤ **maxof**(**int**)

→ *[simplify]*

[1.8] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,13)

Condition defined at:

To prove: minof(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<integer>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2) % 176), [!**false**]:
asType<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176)
== **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2 % 176))

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short**
int>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *
asType<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**
int>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**
int>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *
asType<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**
int>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,*
this.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**
int>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) *
asType<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**
int>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**
int>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) −
(**asType**<**int**>(**asType**<**short int**>(div1.quot)) *
asType<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**
int>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{init}$.r1)) −
(**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $\$heap_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** $\$heap_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $\$heap_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[1.5] -32768 ≤ (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2))

→ *[const member of object with modified fields]*

[1.6] -32768 ≤ (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2))

→ *[const static or extern object]*

[1.7] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.8] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172)))

→ *[simplify]*

[1.13] -32769 < (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[literal comparison of product]*

[1.14] ([172 < 0]: (-32769 / -172) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [0 < 172]: (-32769 / 172) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [0 == 172]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.15] ([172 < 0]: (-32769 / -172) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [(0 < 172) ∧ !(172 < 0)]: (-32769 / 172) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [(0 == 172) ∧ !(0 < 172) ∧ !(172 < 0)]: -32769 < 0)

→ *[simplify]*

[1.23] -191 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[negate goal and search for contradiction]*

[1.24] !(-191 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[1.26] 190 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Create new term from terms 1.26, 28.17 using rule: transitivity 15]

[74.0] (0 + 190) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)

→ *[simplify]*

[74.2] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,13)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <

$-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[Dereference address-of object]*

[2.35] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[simplify]*

[2.36] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[const static or extern object]*

[2.37] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>($heap$_{init}$.M3))

$\rightarrow$ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

$\rightarrow$ *[simplify]*

[2.46] (-30323 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) ≤ **maxof**(**int**)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) ≤ **maxof**(**int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → ***this***.$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* ***this***.*$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* ***this***.*$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.5] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.6] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.7] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.20] -32768 < (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[literal comparison of product]*

[1.21] ([-172 < 0]: (-32768 / 172) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [0 < -172]: (-32768 / -172) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [-172 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.22] ([-172 < 0]: (-32768 / 172) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [(0 < -172) ∧ !(-172 < 0)]: (-32768 / -172) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem, [(-172 == 0) ∧ !(-172 < 0) ∧ !(0 < -172)]: -32768 < 0)

→ *[simplify]*

[1.26] -191 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[negate goal and search for contradiction]*

[1.27] !(-191 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[1.30] 190 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) %

176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[remainder is less than divisor]*

Proof of rule precondition:

[28.17.0] (176 + −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) ≤ 0

→ *[simplify]*

[28.17.11] 175 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem

→ *[from term 1.30, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is true whenever (-1 + literala) < 190]*

Proof of rule precondition:

[28.17.11.0] (-1 + 175) < 190

→ *[simplify]*

[28.17.11.2] **true**

[28.17.12] **true**

[28.18] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,40)

Condition defined at:

To prove: **minof**(**short int**) ≤ div2.quot

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176)

== **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 27.17]

[33.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[simplify]*

[33.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Take goal term]

[1.0] **minof**(**short int**) ≤ div2.quot

→ *[simplify]*

[1.1] -32768 ≤ div2.quot

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[from term 33.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,40)

Condition defined at:

To prove: div2.quot ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs**

$\$heap_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 27.17]

[34.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot ≤ **maxof**(**int**)

→ *[simplify]*

[34.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Take goal term]

[1.0] div2.quot $\leq$ **maxof**(**short int**)

$\rightarrow$ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.10] -32768 $<$ $-$div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

$\rightarrow$ *[from term 34.9, literala $<$ $-$div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) $<$ -32768

$\rightarrow$ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,40)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **asType**<**short int**>(div2.quot)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<integer>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 27.17]

[33.0] **minof**(**int**) ≤ div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot

→ *[simplify]*

[33.3] -32769 < div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot

[Take goal term]

[1.0] **minof**(**int**) ≤ **asType**<**short int**>(div2.quot)

→ *[simplify]*

[1.1] -32768 ≤ **asType**<**short int**>(div2.quot)

→ *[from term 24.7, div2 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 $\leq$ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[from term 33.3, literala < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,40)

Condition defined at:

To prove: **asType**<**short int**>(div2.quot) $\leq$ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 27.17]

[34.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot ≤ **maxof**(**int**)

→ *[simplify]*

[34.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Take goal term]

[1.0] **asType**<**short int**>(div2.quot) ≤ **maxof**(**int**)

→ *[from term 24.7, div2 is equal to div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[from term 34.9, literala < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot is true whenever (-1*

+ literala) < -32768]

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,35)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{790,1;808,8}$.b2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <

asType<integer>($heap$_{funcstart_790,1}$.a3)) =>
(**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0
== **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 ==
asType<integer>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short
int>**((**asType<int>**(**asType<short int>**(div1.rem)) *
asType<int>($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short
int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) <
asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<integer>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$*).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{790,1;808,8}$.b2

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{790,1;808,8}$.b2

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.2] -32768 ≤ $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2

→ *[const member of object with modified fields]*

[1.3] -32768 ≤ $heap$_{funcstart_790,1}$.b2

→ *[const static or extern object]*

[1.4] -32768 ≤ $heap$_{init}$.b2

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.5] -32768 ≤ **asType**<**short int**>((**int**)35)

→ *[simplify]*

[1.8] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,35)

Condition defined at:

To prove: $heap$_{790,1;808,8}$.b2 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *

asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] $heap$_{790,1;808,8}$.b2 ≤ **maxof**(**int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.1] $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2 ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.2] $heap$_{funcstart_790,1}$.b2 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.3] $heap$_{init}$.b2 $\leq$ **maxof**(**int**)

$\rightarrow$ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.4] **asType**<**short int**>((**int**)35) $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.8] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,38)

Condition defined at:

To prove: **minof**(**int**) $\leq$ (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) ==

asType<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) =>

(**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),

asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) <

0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short**

int>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div2.quot)) *

asType<**int**>($heap$_{790,1;808,8}$.b2))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.5] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2))

→ *[const member of object with modified fields]*

[1.6] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2))

→ *[const static or extern object]*

[1.7] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.8] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35)))

→ *[simplify]*

[1.13] -32769 < (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[literal comparison of product]*

[1.14] ([35 < 0]: (-32769 / -35) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [0 < 35]: (-32769 / 35) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [0 == 35]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.15] ([35 < 0]: (-32769 / -35) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(0 < 35) ∧ !(35 < 0)]: (-32769 / 35) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(0 == 35) ∧ !(0 < 35) ∧ !(35 < 0)]: -32769 < 0)

→ *[simplify]*

[1.23] -937 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

→ *[negate goal and search for contradiction]*

[1.24] !(-937 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[1.26] 936 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 1.26, 27.17 using rule: transitivity 15]

[73.0] (0 + 936) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176)

→ *[simplify]*

[73.7] 164736 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[73.7.0] -2 < (0 + 164736)

→ *[simplify]*

[73.7.2] **true**

[73.8] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,38)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**

int>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<int>(operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 / 176))

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)) ≤ **maxof**(**int**)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)) ≤ **maxof**(**int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)) ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.5] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.6] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.7] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.20] -32768 < (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[literal comparison of product]*

[1.21] ([-35 < 0]: (-32768 / 35) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [0 < -35]: (-32768 / -35) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [-35 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.22] ([-35 < 0]: (-32768 / 35) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(0 < -35) ∧ !(-35 < 0)]: (-32768 / -35) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(-35 == 0) ∧ !(-35 < 0) ∧ !(0 < -35)]: -32768 < 0)

→ *[simplify]*

[1.26] -937 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).quot

→ *[negate goal and search for contradiction]*

[1.27] !(-937 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[1.30] 936 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 1.30, 27.17 using rule: transitivity 16]

[73.0] (0 + 936) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176)

→ *[simplify]*

[73.8] 164911 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Work on sub-term 2 of conjunction in term 2.46]

[3.0] -30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

→ *[from term 73.8, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (164911 + literala)]*

Proof of rule precondition:

[3.0.0] -2 < (-30307 + 164911)

→ *[simplify]*

[3.0.2] **true**

[3.1] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,33)

Condition defined at:

To prove: **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) ==

asType<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 2 of conjunction in term 2.46]

[3.0] -30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2 % 176))

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[simplify]*

[1.1] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.2] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[simplify]*

[1.4] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.*__**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*__**replace**(*p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.5] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[const member of object with modified fields]*

[1.6] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[const static or extern object]*

[1.7] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.8] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[simplify]*

[1.11] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.12] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[simplify]*

[1.14] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r → **this**.$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.15] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))

→ *[const member of object with modified fields]*

[1.16] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))

→ *[const static or extern object]*

[1.17] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.18] -32768 ≤ ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))

→ *[simplify]*

[1.25] -32769 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[negate goal and search for contradiction]*

[1.26] !(-32769 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))

→ *[simplify]*

[1.31] 32768 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

[Copy term 1.31]

[81.0] 32768 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[from term 28.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 % 176]*

[81.1] 32768 < ((-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Create new term from term 27.17 using rule: condition for equality of division]

[120.0] ((176 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))))

→ *[simplify]*

[120.15] (-1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (-176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)))

[Work on sub-term 2 of conjunction in term 120.15]

[121.0] -1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

[Create new term from terms 121.0, 3.0 using rule: transitivity 2]

[150.0] (-30307 + -1 + 1) < (-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[150.1] -30307 < (-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[literal comparison of product]*

[150.2] ([-176 < 0]: (-30307 / 176) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [0 < -176]: (-30307 / -176) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [-176 == 0]: -30307 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[150.3] ([-176 < 0]: (-30307 / 176) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(0 < -176) ∧ !(-176 < 0)]: (-30307 / -176) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(-176 == 0) ∧ !(-176 < 0) ∧ !(0 < -176)]: -30307 < 0)

→ *[simplify]*

[150.7] -173 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 150.7, 81.1 using rule: transitivity 5]

[152.0] 32768 < ((-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)) + (35 * −(-173 + 1)))

→ *[simplify]*

[152.5] 26748 < (-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[literal comparison of product]*

[152.6] ([-172 < 0]: (26748 / 172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 < -172]: (26748 / -172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [-172 == 0]: 26748 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[152.7] ([-172 < 0]: (26748 / 172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 < -172) ∧ !(-172 < 0)]: (26748 / -172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(-172 == 0) ∧ !(-172 < 0) ∧ !(0 < -172)]: 26748 < 0)

→ *[simplify]*

[152.12] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (74,33)

Condition defined at:

To prove: ((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3), **asType<int>**($\$heap_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($\$heap_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($\$heap_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($\$heap_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType<integer>**($\$heap_{790,1;808,8}$.M1)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269

$< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 $<$ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) $<$ **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[Dereference address-of object]*

[2.31] (((-30307 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 $<$ **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) $<$ **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[simplify]*

[2.34] ((-30307 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) $<$ **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[Dereference address-of object]*

[2.35] ((-30307 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $<$ **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[simplify]*

[2.36] ((-30307 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 $<$ **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

$\rightarrow$ *[const static or extern object]*

[2.37] ((-30307 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 $< -$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator '/' in class 'int' at built in declaration]*

[27.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) <

0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Take given term]

[37.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) =>

(**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[const static or extern object]*

[37.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[37.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)176))) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.10] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[37.11] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.12] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.13] (-176 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))

→ *[simplify]*

[37.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *

asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.10] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($\$heap_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take goal term]

[1.0] ((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.1] ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.*__**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*__**replace**(*p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.4] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[const member of object with modified fields]*

[1.5] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.6] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[1.7] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[1.11] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.13] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2))) ≤ **maxof**(**short int**)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.14] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2))) ≤ **maxof**(**short int**)

→ *[const member of object with modified fields]*

[1.15] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.16] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[1.17] ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35)))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.36] -32768 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[negate goal and search for contradiction]*

[1.37] !(-32768 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)))

→ *[simplify]*

[1.42] 32767 < ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Branch on disjunction or conditional in term 37.19]

[67.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

[Copy term 1.42]

[68.0] (32767 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 67.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2]*

[68.1] (32767 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) ∨ ...

[Copy term 28.17]

[69.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))) ∨ (175 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 67.0, div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2]*

[69.1] (0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 % 176))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 69.1]

[70.0] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < 176) ∨ (175 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[simplify]*

[70.3] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∨ ...

[Copy term 68.1]

[76.0] (32767 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))) ∨ (175 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 27.17, div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176).quot is equal to* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2 / 176]*

[76.1] (32767 < ((-35 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 / 176)) + (172 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))) ∨ ...

→ *[division by larger divisor]*

Proof of rule precondition 1:

[76.1.0.0] literald < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 70.3]*

[76.1.0.1] **true**

Proof of rule precondition 2:

[76.1.1.0] literalc < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 6.0]*

[76.1.1.1] **true**

Proof of rule precondition 3:

[76.1.2.0] $-$-176 $\leq$ 176

$\rightarrow$ *[simplify]*

[76.1.2.2] **true**

Proof of rule precondition 4:

[76.1.3.0] -2 $<$ 0

$\rightarrow$ *[simplify]*

[76.1.3.1] **true**

[76.2] (32767 $<$ ((-35 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) + (172 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) $\vee$ ...

$\rightarrow$ *[simplify]*

[76.4] (32767 $<$ (137 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) $\vee$ ...

$\rightarrow$ *[literal comparison of product]*

[76.5] ([137 $<$ 0]: (32767 / -137) $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [0 $<$ 137]: (32767 / 137) $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [0 == 137]: 32767 $<$ 0) $\vee$ ...

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[76.6] ([137 $<$ 0]: (32767 / -137) $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [(0 $<$ 137) $\wedge$!(137 $<$ 0)]: (32767 / 137) $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [(0 == 137) $\wedge$!(0 $<$ 137) $\wedge$!(137 $<$ 0)]: 32767 $<$ 0) $\vee$ ...

$\rightarrow$ *[simplify]*

[76.13] (**true** $\wedge$ (239 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) $\vee$ ...

$\rightarrow$ *[from term 70.3, literala $<$* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 is false whenever -2 $<$ (-176 + literala)]*

Proof of rule precondition:

[76.13.0] -2 $<$ (-176 + 239)

$\rightarrow$ *[simplify]*

[76.13.2] **true**

[76.14] (**true** $\wedge$ **false**) $\vee$ ...

$\rightarrow$ *[simplify]*

[76.15] **false** $\vee$ ...

[Remove 'false' term 76.15 and fetch new term from containing clause]

[77.0] 175 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Copy term 1.42]

[80.0] 32767 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 28.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 % 176]*

[80.1] 32767 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)))

[Create new term from term 27.17 using rule: condition for equality of division]

[109.0] ((176 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))))

→ *[simplify]*

[109.15] (-1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (-176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)))

→ *[separate conjunction and work on first sub-term]*

[109.16] -176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Create new term from terms 109.16, 77.0 using rule: transitivity 2]

[142.0] (-176 + 1 + 175) < (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[142.1] 0 < (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[product is positive]*

[142.2] ((0 < 176) ∧ (0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) ∨ ((176 < 0) ∧ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot < 0))

→ *[simplify]*

[142.7] 0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 142.7, 80.1 using rule: transitivity 11]

[145.0] (1 + 32767 + (0 * 35)) < (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[simplify]*

[145.2] 32768 < (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[literal comparison of product]*

[145.3] ([172 < 0]: (32768 / -172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 < 172]: (32768 / 172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 == 172]: 32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[145.4] ([172 < 0]: (32768 / -172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 < 172) ∧ !(172 < 0)]: (32768 / 172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 == 172) ∧ !(0 < 172) ∧ !(172 < 0)]: 32768 < 0)

→ *[simplify]*

[145.13] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (75,31)

To prove: **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) %

176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Take given term]

[37.0] (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[const static or extern object]*

[37.3] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{init}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[37.4] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)176))) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.10] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[37.11] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) => (**asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[simplify]*

[37.12] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) => (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[37.13] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) => (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem ==

asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))

→ *[simplify]*

[37.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *

asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → ***this***.$r*.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* ***this***.$r*.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** *$heap$_{funcstart_790,1}$,* ***this***.$r*.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot *
asType<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**
int>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot *
asType<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**
int>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot *
asType<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.*__**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*__**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*__**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*__**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*__**replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.1] **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).__**replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **asType<integer>(this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).__**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[simplify]*

[1.8] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.9] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).M2)

→ *[const member of object with modified fields]*

[1.11] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2)

→ *[const static or extern object]*

[1.12] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>($heap$_{init}$.M2)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.13] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30307))

→ *[simplify]*

[1.23] -30307 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[negate goal and search for contradiction]*

[1.24] !(-30307 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2,

176).quot)))

→ *[simplify]*

[1.29] 30306 < ((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Branch on disjunction or conditional in term 37.19]

[71.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

[Copy term 1.29]

[74.0] (30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 71.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2]*

[74.1] (30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) ∨ ...

[Copy term 28.17]

[75.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 71.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2]*

[75.1] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 75.1]

[76.0] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < 176) ∨ (175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[simplify]*

[76.3] (-176 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∨ ...

[Copy term 74.1]

[82.0] (30306 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))) ∨ (175 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 + div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 27.17, div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176).quot is equal to* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2 / 176]*

[82.1] (30306 < ((-35 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 / 176)) + (172 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))) ∨ ...

→ *[division by larger divisor]*

Proof of rule precondition 1:

[82.1.0.0] literald < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 76.3]*

[82.1.0.1] **true**

Proof of rule precondition 2:

[82.1.1.0] literalc < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2

→ *[unify with term 6.0]*

[82.1.1.1] **true**

Proof of rule precondition 3:

[82.1.2.0] −-176 ≤ 176

→ *[simplify]*

[82.1.2.2] **true**

Proof of rule precondition 4:

[82.1.3.0] -2 < 0

→ *[simplify]*

[82.1.3.1] **true**

[82.2] (30306 < ((-35 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) + (172 * **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2))) ∨ ...

→ *[simplify]*

[82.4] (30306 < (137 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∨ ...

→ *[literal comparison of product]*

[82.5] ([137 < 0]: (30306 / -137) < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [0 < 137]: (30306 / 137) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [0 == 137]: 30306 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[82.6] ([137 < 0]: (30306 / -137) < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [(0 < 137) ∧ !(137 < 0)]: (30306 / 137) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, [(0 == 137) ∧ !(0 < 137) ∧ !(137 < 0)]: 30306 < 0) ∨ ...

→ *[simplify]*

[82.13] (**true** ∧ (221 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∨ ...

→ *[from term 76.3, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2 is false whenever -2 < (-176 + literala)]*

Proof of rule precondition:

[82.13.0] -2 < (-176 + 221)

→ *[simplify]*

[82.13.2] **true**

[82.14] (**true** ∧ **false**) ∨ ...

→ *[simplify]*

[82.15] **false** ∨ ...

[Remove 'false' term 82.15 and fetch new term from containing clause]

[83.0] 175 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Copy term 1.29]

[86.0] 30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[from term 28.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2 % 176]*

[86.1] 30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)))

[Create new term from term 27.17 using rule: condition for equality of division]

[115.0] ((176 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))) < (1 +

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))))

→ *[simplify]*

[115.15] (-1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (-176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)))

→ *[separate conjunction and work on first sub-term]*

[115.16] -176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Create new term from terms 115.16, 83.0 using rule: transitivity 2]

[148.0] (-176 + 1 + 175) < (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[148.1] 0 < (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[product is positive]*

[148.2] ((0 < 176) ∧ (0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) ∨ ((176 < 0) ∧ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot < 0))

→ *[simplify]*

[148.7] 0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 148.7, 86.1 using rule: transitivity 11]

[151.0] (1 + 30306 + (0 * 35)) < (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[simplify]*

[151.2] 30307 < (172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[literal comparison of product]*

[151.3] ([172 < 0]: (30307 / -172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 < 172]: (30307 / 172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 == 172]: 30307 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[151.4] ([172 < 0]: (30307 / -172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 < 172) ∧ !(172 < 0)]: (30307 / 172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 == 172) ∧ !(0 < 172) ∧ !(172 < 0)]: 30307 < 0)

→ *[simplify]*

[151.13] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (75,12)

To prove: −**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269
< −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3)))
&& (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 2 of conjunction in term 2.46]

[3.0] -30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Work on sub-term 5 of conjunction in term 2.46]

[6.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[27.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / **asType<integer>**(176)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[27.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[27.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.7.0] -2 < (0 + 0)

→ *[simplify]*

[27.7.2] **true**

[27.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[27.11.0] -2 < (0 + 0)

→ *[simplify]*

[27.11.2] **true**

[27.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) / 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[27.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 / 176))

[Assume known post-assertion, class invariant or type constraint for term 24.7]

[28.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % **asType**<**integer**>(176)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[28.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[28.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.7.0] -2 < (0 + 0)

→ *[simplify]*

[28.7.2] **true**

[28.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[from term 6.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[28.11.0] -2 < (0 + 0)

→ *[simplify]*

[28.11.2] **true**

[28.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) % 176) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)

→ *[simplify]*

[28.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *

asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] −**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[1.1] −**asType**<**integer const**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[const member of object with modified fields]*

[1.3] −**asType**<**integer const**>($\$heap_{funcstart_790,1}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[const static or extern object]*

[1.4] −**asType**<**integer const**>($\$heap_{init}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.5] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30307)) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[simplify]*

[1.9] -30307 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[1.10] -30307 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).p2)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.11] -30307 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2)

→ *[evaluate dereferenced pointer into modified heap]*

[1.12] -30307 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.13] -30307 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)

→ *[simplify]*

[1.17] -30307 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

→ *[negate goal and search for contradiction]*

[1.18] !(-30307 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))

→ *[simplify]*

[1.23] 30306 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

[Copy term 1.23]

[85.0] 30306 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

→ *[from term 28.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2 % 176]*

[85.1] 30306 < ((-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))

[Create new term from term 27.17 using rule: condition for equality of division]

[124.0] ((176 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < (176 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))))

→ *[simplify]*

[124.15] (-1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) ∧ (-176 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 + (176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)))

[Work on sub-term 2 of conjunction in term 124.15]

[125.0] -1 < ((-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

[Create new term from terms 125.0, 3.0 using rule: transitivity 2]

[154.0] (-30307 + -1 + 1) < (-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[simplify]*

[154.1] -30307 < (-176 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

→ *[literal comparison of product]*

[154.2] ([-176 < 0]: (-30307 / 176) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [0 < -176]: (-30307 / -176) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [-176 == 0]: -30307 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[154.3] ([-176 < 0]: (-30307 / 176) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(0 < -176) ∧ !(-176 < 0)]: (-30307 / -176) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot, [(-176 == 0) ∧ !(-176 < 0) ∧ !(0 < -176)]: -30307 < 0)

→ *[simplify]*

[154.7] -173 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot

[Create new term from terms 154.7, 85.1 using rule: transitivity 5]

[156.0] 30306 < ((-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176)) + (35 * −(-173 + 1)))

→ *[simplify]*

[156.5] 24286 < (-172 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176))

→ *[literal comparison of product]*

[156.6] ([-172 < 0]: (24286 / 172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [0 < -172]: (24286 / -172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [-172 == 0]: 24286 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[156.7] ([-172 < 0]: (24286 / 172) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(0 < -172) ∧ !(-172 < 0)]: (24286 / -172) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 % 176), [(-172 == 0) ∧ !(-172 < 0) ∧ !(0 < -172)]: 24286 < 0)

→ *[simplify]*

[156.12] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,15)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ div3.rem

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) $\wedge$ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) $\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) %
asType<**integer**>(178)) == **asType**<**integer**>(div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) ==

asType<integer>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Assume known post-assertion, class invariant or type constraint for term 44.17]

[51.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[simplify]*

[51.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

[Take goal term]

[1.0] **minof**(**short int**) ≤ div3.rem

→ *[simplify]*

[1.1] -32768 ≤ div3.rem

→ *[from term 40.7, div3 is equal to div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[from term 51.3, literala < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,15)

Condition defined at:

To prove: div3.rem ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType<integer>**(178)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Assume known post-assertion, class invariant or type constraint for term 44.17]

[52.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem ≤ **maxof**(**int**)

→ *[simplify]*

[52.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

[Take goal term]

[1.0] div3.rem ≤ **maxof**(**short int**)

→ *[from term 40.7, div3 is equal to div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[from term 52.9, literala < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem is true whenever (-1 +*

literala) < -32768]

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,15)

Condition defined at:

To prove: **minof**(**int**) ≤ **asType**<**short int**>(div3.rem)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <

asType<integer>($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178))

[Assume known post-assertion, class invariant or type constraint for term 44.17]

[51.0] **minof**(**int**) ≤ div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem

→ *[simplify]*

[51.3] -32769 < div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem

[Take goal term]

[1.0] **minof**(**int**) ≤ **asType**<**short int**>(div3.rem)

→ *[simplify]*

[1.1] -32768 ≤ **asType**<**short int**>(div3.rem)

→ *[from term 40.7, div3 is equal to div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 $\leq$ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[from term 51.3, literala < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,15)

Condition defined at:

To prove: **asType**<**short int**>(div3.rem) $\leq$ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Assume known post-assertion, class invariant or type constraint for term 44.17]

[52.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem ≤ **maxof**(**int**)

→ *[simplify]*

[52.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

[Take goal term]

[1.0] **asType<short int>**(div3.rem) $\leq$ **maxof**(**int**)

$\rightarrow$ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] **asType<short int>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.11] -32768 < $-$div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

$\rightarrow$ *[from term 52.9, literala < $-$div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

$\rightarrow$ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,10)

Condition defined at:

To prove: **minof**(**int**) $\leq$ $heap$_{790,1;810,8}$.r3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{790,1;810,8}$.r3

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{790,1;810,8}$.r3

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.2] -32768 ≤ $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3

→ *[const member of object with modified fields]*

[1.4] -32768 ≤ $heap$_{funcstart_790,1}$.r3

→ *[const static or extern object]*

[1.5] -32768 ≤ $heap$_{init}$.r3

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.6] -32768 ≤ **asType**<**short int**>((**int**)170)

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,10)

Condition defined at:

To prove: $\$heap_{790,1;810,8}$.r3 $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 ==

asType<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

$-$**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

$-$**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) <
asType<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short**
int>((**asType<int>**(**asType<short int>**(div1.rem)) *
asType<int>($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short**
int>(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short**
int>((**asType<int>**(**asType<short int>**(div1.rem)) *
asType<int>($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short**
int>(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short**
int>((**asType<int>**(**asType<short int>**(div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *
asType<int>($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short**
int>(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] $heap$_{790,1;810,8}$.r3 ≤ **maxof**(**int**)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.1] $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3 ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.3] $\$heap_{funcstart_790,1}$.r3 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.4] $\$heap_{init}$.r3 ≤ **maxof**(**int**)

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.5] **asType**<**short int**>((**int**)170) ≤ **maxof**(**int**)

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,13)

Condition defined at:

To prove: **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to*

*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → (-2 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) *

asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.***_replace**(***this**.*$r* → **this**.*$r*.**value**(***heapIs** *$\$heap_{funcstart_790,1}$).***_replace**(*p1 → (-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot *

asType<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.5] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3))

→ *[const member of object with modified fields]*

[1.7] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3))

→ *[const static or extern object]*

[1.8] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.9] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170)))

→ *[simplify]*

[1.14] -32769 < (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[literal comparison of product]*

[1.15] ([170 < 0]: (-32769 / -170) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [0 < 170]: (-32769 / 170) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [0 == 170]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.16] ([170 < 0]: (-32769 / -170) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [(0 < 170) ∧ !(170 < 0)]: (-32769 / 170) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [(0 == 170) ∧ !(0 < 170) ∧ !(170 < 0)]: -32769 < 0)

→ *[simplify]*

[1.24] -193 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[negate goal and search for contradiction]*

[1.25] !(-193 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[1.27] 192 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

[Create new term from terms 1.27, 44.17 using rule: transitivity 15]

[84.0] (0 + 192) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)

→ *[simplify]*

[84.2] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,13)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) ==

asType<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *

asType<int>($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short**

int>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.8] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) *

asType<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$*).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) ≤ **maxof**(**int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) ≤ **maxof**(**int**)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs***

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.6] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.7] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.8] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.21] -32768 < (-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[literal comparison of product]*

[1.22] ([-170 < 0]: (-32768 / 170) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [0 < -170]: (-32768 / -170) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [-170 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.23] ([-170 < 0]: (-32768 / 170) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [(0 < -170) ∧ !(-170

< 0)]: (-32768 / -170) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem, [(-170 == 0) ∧ !(-170 < 0) ∧ !(0 < -170)]: -32768 < 0)

→ *[simplify]*

[1.27] -193 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[negate goal and search for contradiction]*

[1.28] !(-193 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[1.31] 192 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

→ *[remainder is less than divisor]*

Proof of rule precondition:

[44.17.0] (178 + −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) ≤ 0

→ *[simplify]*

[44.17.11] 177 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem

→ *[from term 1.31, literala < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem is true whenever (-1 + literala) < 192]*

Proof of rule precondition:

[44.17.11.0] (-1 + 177) < 192

→ *[simplify]*

[44.17.11.2] **true**

[44.17.12] **true**

[44.18] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,40)

Condition defined at:

To prove: **minof**(**short int**) ≤ div3.quot

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 43.17]

[49.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[simplify]*

[49.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ div3.quot

$\rightarrow$ *[simplify]*

[1.1] -32768 $\leq$ div3.quot

$\rightarrow$ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 $\leq$ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

$\rightarrow$ *[simplify]*

[1.4] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

$\rightarrow$ *[from term 49.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.4.0] (-32769 + -1) < -32769

$\rightarrow$ *[simplify]*

[1.4.2] **true**

[1.5] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,40)

Condition defined at:

To prove: div3.quot $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType<integer>**(178)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]:

$-(-$**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: $-(-$**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: $-(-$**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: $-(-$**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term

43.17]

[50.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot ≤ **maxof**(**int**)

→ *[simplify]*

[50.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Take goal term]

[1.0] div3.quot ≤ **maxof**(**short int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot ≤ **maxof**(**short int**)

→ *[simplify]*

[1.10] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[from term 50.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.10.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.10.2] **true**

[1.11] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,40)

Condition defined at:

To prove: **minof**(**int**) ≤ **asType**<**short int**>(div3.quot)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)
∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType<integer>**(178)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator '/' in class 'int' at built in declaration]*

[43.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 43.17]

[49.0] **minof**(**int**) ≤ div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[simplify]*

[49.3] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Take goal term]

[1.0] **minof**(**int**) ≤ **asType**<**short int**>(div3.quot)

→ *[simplify]*

[1.1] -32768 ≤ **asType**<**short int**>(div3.quot)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 ≤ **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[1.5] -32769 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[from term 49.3, literala < div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is true whenever (-1 + literala) < -32769]*

Proof of rule precondition:

[1.5.0] (-32769 + -1) < -32769

→ *[simplify]*

[1.5.2] **true**

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,40)

Condition defined at:

To prove: **asType**<**short int**>(div3.quot) $\leq$ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(operator*(heapIs $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>(this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2

< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<integer>(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3

[Take given term]

[40.0] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>($\$heap_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator '/' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 43.17]

[50.0] div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot ≤ **maxof**(**int**)

→ *[simplify]*

[50.9] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Take goal term]

[1.0] **asType**<**short int**>(div3.quot) ≤ **maxof**(**int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] **asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] -32768 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[from term 50.9, literala < −div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is true whenever (-1 + literala) < -32768]*

Proof of rule precondition:

[1.11.0] (-32768 + -1) < -32768

→ *[simplify]*

[1.11.2] **true**

[1.12] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at:

C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,35)

Condition defined at:

To prove: **minof**(**int**) $\leq$ $heap$_{790,1;810,8}$.b3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**

int>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *

asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType<int>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType<short int>**((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType<int>**($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType<short int>**((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType<int>**($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ $\$heap_{790,1;810,8}$.b3

→ *[simplify]*

[1.1] -32768 ≤ $\$heap_{790,1;810,8}$.b3

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[1.2] -32768 ≤ $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3

→ *[const member of object with modified fields]*

[1.4] -32768 ≤ $heap$_{funcstart_790,1}$.b3

→ *[const static or extern object]*

[1.5] -32768 ≤ $heap$_{init}$.b3

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.6] -32768 ≤ **asType**<**short int**>((**int**)63)

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,35)

Condition defined at:

To prove: $heap$_{790,1;810,8}$.b3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),

asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176)

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] $\$heap_{790,1;810,8}$.b3 ≤ **maxof**(**int**)

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.1] $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3 ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.3] $heap$_{funcstart_790,1}$.b3 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.4] $heap$_{init}$.b3 ≤ **maxof**(**int**)

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.5] **asType<short int>**((**int**)63) ≤ **maxof**(**int**)

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,38)

Condition defined at:

To prove: **minof**(**int**) ≤ (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <

asType<integer>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)

$\wedge$ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, **asType**<**int**>($\$heap_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>($\$heap_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.8] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to* *$\$heap_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).***_replace**(*p1 → (-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 ≤ (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))

→ *[simplify]*

[1.4] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.5] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3))

→ *[const member of object with modified fields]*

[1.7] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3))

→ *[const static or extern object]*

[1.8] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.9] -32768 ≤ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63)))

→ *[simplify]*

[1.14] -32769 < (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[literal comparison of product]*

[1.15] ([63 < 0]: (-32769 / -63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 < 63]: (-32769 / 63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 == 63]: -32769 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.16] ([63 < 0]: (-32769 / -63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 < 63) ∧ !(63 < 0)]: (-32769 / 63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 == 63) ∧ !(0 < 63) ∧ !(63 < 0)]: -32769 < 0)

→ *[simplify]*

[1.24] -521 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[negate goal and search for contradiction]*

[1.25] !(-521 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[1.27] 520 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 1.27, 43.17 using rule: transitivity 15]

[83.0] (0 + 520) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)

→ *[simplify]*

[83.7] 92560 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[83.7.0] -2 < (0 + 92560)

→ *[simplify]*

[83.7.2] **true**

[83.8] **false**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,38)

Condition defined at:

To prove: (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType<integer>**($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&

(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[2.47] -30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<int>(this.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p1, **asType<int>(asType<short int>((int)**177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(this.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p2, **asType<int>(asType<short int>((int)**176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**
$heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,

asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType<integer>**(178)) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator '/' in class 'int' at built in declaration]*

[43.3] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 / 178))

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short**

int>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)) ≤ **maxof**(**int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[1.1] (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.3] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)) ≤ **maxof**(**int**)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.4] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)) ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.6] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.7] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.8] (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.21] -32768 < (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[literal comparison of product]*

[1.22] ([-63 < 0]: (-32768 / 63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 < -63]: (-32768 / -63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [-63 == 0]: -32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.23] ([-63 < 0]: (-32768 / 63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 < -63) ∧ !(-63 < 0)]: (-32768 / -63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(-63 == 0) ∧ !(-63 < 0) ∧ !(0 < -63)]: -32768 < 0)

→ *[simplify]*

[1.27] -521 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

→ *[negate goal and search for contradiction]*

[1.28] !(-521 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[1.31] 520 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 1.31, 43.17 using rule: transitivity 16]

[83.0] (0 + 520) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)

→ *[simplify]*

[83.8] 92737 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[2.47] -30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[from term 83.8, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (92737 + literala)]*

Proof of rule precondition:

[2.47.0] -2 < (-30323 + 92737)

→ *[simplify]*

[2.47.2] **true**

[2.48] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,33)

Condition defined at:

To prove: **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <

asType<integer>($heap$_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($heap$_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($heap$_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>($heap$_{init}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2
< **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[2.47] -30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.8] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to* *$\$heap_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).***_replace**(*p1 → (-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] **minof**(**short int**) ≤ ((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[simplify]*

[1.1] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.2] -32768 ≤ ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[simplify]*

[1.4] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r → ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.5] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[const member of object with modified fields]*

[1.7] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[const static or extern object]*

[1.8] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.9] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[simplify]*

[1.12] -32768 ≤ ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.13] -32768 ≤ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[simplify]*

[1.15] -32768 ≤ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.16] -32768 ≤ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))

→ *[const member of object with modified fields]*

[1.18] -32768 ≤ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))

→ *[const static or extern object]*

[1.19] -32768 ≤ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.20] -32768 $\leq$ ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))

→ *[simplify]*

[1.27] -32769 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[negate goal and search for contradiction]*

[1.28] !(-32769 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))

→ *[simplify]*

[1.33] 32768 < ((63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Copy term 1.33]

[91.0] 32768 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[from term 44.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 % 178]*

[91.1] 32768 < ((-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Create new term from term 43.17 using rule: condition for equality of division]

[145.0] ((178 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))))

→ *[simplify]*

[145.15] (-1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (-178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

[Work on sub-term 2 of conjunction in term 145.15]

[146.0] -1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Create new term from terms 146.0, 2.47 using rule: transitivity 2]

[157.0] (-30323 + -1 + 1) < (-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[157.1] -30323 < (-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[literal comparison of product]*

[157.2] ([-178 < 0]: (-30323 / 178) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 < -178]: (-30323 / -178) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [-178 == 0]: -30323 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[157.3] ([-178 < 0]: (-30323 / 178) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 < -178) ∧ !(-178 < 0)]: (-30323 / -178) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(-178 == 0) ∧ !(-178 < 0) ∧ !(0 < -178)]: -30323 < 0)

→ *[simplify]*

[157.7] -171 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 157.7, 91.1 using rule: transitivity 5]

[160.0] 32768 < ((-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)) + (63 * −(-171 + 1)))

→ *[simplify]*

[160.5] 22058 < (-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

→ *[literal comparison of product]*

[160.6] ([-170 < 0]: (22058 / 170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [0 < -170]: (22058 / -170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [-170 == 0]: 22058 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[160.7] ([-170 < 0]: (22058 / 170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(0 < -170) ∧ !(-170 < 0)]: (22058 / -170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(-170 == 0) ∧ !(-170

$< 0) \wedge !(0 < -170)]$: $22058 < 0)$

$\rightarrow$ *[simplify]*

[160.12] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (76,33)

Condition defined at:

To prove: ((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <

asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2),
asType<int>($\$heap_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2),
asType<int>($\$heap_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, **asType<int>**($\$heap_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, **asType<int>**($\$heap_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3),
asType<int>($\$heap_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3),
asType<int>($\$heap_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, **asType<int>**($\$heap_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, **asType<int>**($\$heap_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) %

178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Take given term]

[53.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[const static or extern object]*

[53.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[53.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)178))) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.10] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$*).p3, 178)]*

[53.11] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.12] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.13] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))

→ *[simplify]*

[53.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$*).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r ==

this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take goal term]

[1.0] ((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.1] ((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r → **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r → **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs***

$heap$_{funcstart_790,1}$).p2, 176).rem)))]

[1.4] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[const member of object with modified fields]*

[1.6] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.7] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[1.8] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.11] ((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[1.12] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤

maxof(**short int**)

→ *[simplify]*

[1.14] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3))) ≤ **maxof**(**short int**)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[1.15] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3))) ≤ **maxof**(**short int**)

→ *[const member of object with modified fields]*

[1.17] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3))) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.18] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3))) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[1.19] ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63)))) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.38] -32768 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[negate goal and search for contradiction]*

[1.39] !(-32768 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

→ *[simplify]*

[1.44] 32767 < ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Branch on disjunction or conditional in term 53.19]

[80.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Copy term 1.44]

[81.0] (32767 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 80.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3]*

[81.1] (32767 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) ∨ ...

[Copy term 44.17]

[82.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 80.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3]*

[82.1] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 82.1]

[83.0] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < 178) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[simplify]*

[83.3] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ ...

[Copy term 81.1]

[86.0] (32767 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 43.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 / 178]*

[86.1] (32767 < ((-63 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)) + (170 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) ∨ ...

→ *[division by larger divisor]*

Proof of rule precondition 1:

[86.1.0.0] literald < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 83.3]*

[86.1.0.1] **true**

Proof of rule precondition 2:

[86.1.1.0] literalc < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 7.0]*

[86.1.1.1] **true**

Proof of rule precondition 3:

[86.1.2.0] $-$-178 $\leq$ 178

→ *[simplify]*

[86.1.2.2] **true**

Proof of rule precondition 4:

[86.1.3.0] -2 < 0

→ *[simplify]*

[86.1.3.1] **true**

[86.2] (32767 < ((-63 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) + (170 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) ∨ ...

→ *[simplify]*

[86.4] (32767 < (107 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∨ ...

→ *[literal comparison of product]*

[86.5] ([107 < 0]: (32767 / -107) < $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, [0 < 107]: (32767 / 107) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, [0 == 107]: 32767 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.6] ([107 < 0]: (32767 / -107) < $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, [(0 < 107) ∧ !(107 < 0)]: (32767 / 107) < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, [(0 == 107) ∧ !(0 < 107) ∧ !(107 < 0)]: 32767 < 0) ∨ ...

→ *[simplify]*

[86.13] (**true** ∧ (306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∨ ...

→ *[from term 83.3, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3 is false whenever -2 < (-178 + literala)]*

Proof of rule precondition:

[86.13.0] -2 < (-178 + 306)

→ *[simplify]*

[86.13.2] **true**

[86.14] (**true** ∧ **false**) ∨ ...

→ *[simplify]*

[86.15] **false** ∨ ...

[Remove 'false' term 86.15 and fetch new term from containing clause]

[87.0] 177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Copy term 1.44]

[90.0] 32767 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 44.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 % 178]*

[90.1] 32767 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)))

[Create new term from term 43.17 using rule: condition for equality of division]

[155.0] ((178 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))))

→ *[simplify]*

[155.15] (-1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (-178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

→ *[separate conjunction and work on first sub-term]*

[155.16] -178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Create new term from terms 155.16, 87.0 using rule: transitivity 2]

[166.0] (-178 + 1 + 177) < (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[166.1] 0 < (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[product is positive]*

[166.2] ((0 < 178) ∧ (0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) ∨ ((178 < 0) ∧ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).quot < 0))

→ *[simplify]*

[166.7] 0 < div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 166.7, 90.1 using rule: transitivity 11]

[169.0] (1 + 32767 + (0 * 63)) < (170 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178))

→ *[simplify]*

[169.2] 32768 < (170 * (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178))

→ *[literal comparison of product]*

[169.3] ([170 < 0]: (32768 / -170) < −(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178), [0 < 170]: (32768 / 170) < (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178), [0 == 170]: 32768 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[169.4] ([170 < 0]: (32768 / -170) < −(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178), [(0 < 170) ∧ !(170 < 0)]: (32768 / 170) < (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 % 178), [(0 == 170) ∧ !(0 < 170) ∧ !(170 < 0)]: 32768 < 0)

→ *[simplify]*

[169.13] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (77,31)

To prove: **asType<integer>**(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType<integer>**($\$heap_{790,1;812,8}$.M3)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<integer>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<integer>(operator*(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcstart_790,1}$.M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) /

178), []: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType<integer>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

[Take given term]

[53.0] (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.1] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) =>

(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[const static or extern object]*

[53.3] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[53.4] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)178))) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.10] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[53.11] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (**asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[simplify]*

[53.12] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[53.13] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) => (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))

→ *[simplify]*

[53.19] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

$\vee$ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short**

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []:

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) *

asType<int>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType<short int>**((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType<int>**($heap$_{init}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)*

*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.1] **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[simplify]*

[1.8] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[1.9] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType<integer>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M3)

→ *[const member of object with modified fields]*

[1.12] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3)

→ *[const static or extern object]*

[1.13] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>($heap$_{init}$.M3)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.14] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30323))

→ *[simplify]*

[1.24] -30323 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[negate goal and search for contradiction]*

[1.25] !(-30323 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

→ *[simplify]*

[1.30] 30322 < ((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Branch on disjunction or conditional in term 53.19]

[86.0] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Copy term 1.30]

[91.0] (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 86.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3]*

[91.1] (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3))) ∨ ...

[Copy term 44.17]

[92.0] (0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 86.0, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3]*

[92.1] (0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))) ∨ ...

[Assume known post-assertion, class invariant or type constraint for term 92.1]

[93.0] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < 178) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[simplify]*

[93.3] (-178 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ ...

[Create new term from terms 91.1, 93.3 using rule: transitivity 5r]

[94.0] (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * −(-178 + 1)))) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[simplify]*

[94.5] (232 < (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) ∨ ...

→ *[literal comparison of product]*

[94.6] ([-63 < 0]: (232 / 63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 < -63]: (232 / -63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [-63 == 0]: 232 < 0) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[94.7] ([-63 < 0]: (232 / 63) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 < -63) ∧ !(-63 < 0)]: (232 / -63) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(-63 == 0) ∧ !(-63 < 0) ∧ !(0 < -63)]: 232 < 0) ∨ ...

→ *[simplify]*

[94.11] (3 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) ∨ ...

[Create new term from terms 94.11, 43.17 using rule: transitivity 15]

[96.0] ((0 + 3) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)) ∨ (177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ !(0 == (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[simplify]*

[96.1] (3 < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178)) ∨ ...

→ *[division by larger divisor]*

Proof of rule precondition 1:

[96.1.0.0] literald < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 93.3]*

[96.1.0.1] **true**

Proof of rule precondition 2:

[96.1.1.0] literalc < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

→ *[unify with term 7.0]*

[96.1.1.1] **true**

Proof of rule precondition 3:

[96.1.2.0] −-178 ≤ 178

→ *[simplify]*

[96.1.2.2] **true**

Proof of rule precondition 4:

[96.1.3.0] -2 < 0

→ *[simplify]*

[96.1.3.1] **true**

[96.2] (3 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) ∨ ...

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is*

false whenever -2 < (0 + literala)]

Proof of rule precondition:

[96.2.0] -2 < (0 + 3)

→ *[simplify]*

[96.2.2] **true**

[96.3] **false** ∨ ...

[Remove 'false' term 96.3 and fetch new term from containing clause]

[97.0] 177 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Copy term 1.30]

[101.0] 30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[from term 44.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 % 178]*

[101.1] 30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)))

[Create new term from term 43.17 using rule: condition for equality of division]

[155.0] ((178 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))))

→ *[simplify]*

[155.15] (-1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (-178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

→ *[separate conjunction and work on first sub-term]*

[155.16] -178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Create new term from terms 155.16, 97.0 using rule: transitivity 2]

[161.0] (-178 + 1 + 177) < (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[161.1] 0 < (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[product is positive]*

[161.2] ((0 < 178) ∧ (0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) ∨ ((178 < 0) ∧ (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot < 0))

→ *[simplify]*

[161.7] 0 < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 161.7, 101.1 using rule: transitivity 11]

[163.0] (1 + 30322 + (0 * 63)) < (170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

→ *[simplify]*

[163.2] 30323 < (170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

→ *[literal comparison of product]*

[163.3] ([170 < 0]: (30323 / -170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [0 < 170]: (30323 / 170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [0 == 170]: 30323 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[163.4] ([170 < 0]: (30323 / -170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(0 < 170) ∧ !(170 < 0)]: (30323 / 170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(0 == 170) ∧ !(0 < 170) ∧ !(170 < 0)]: 30323 < 0)

→ *[simplify]*

[163.13] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (77,12)

To prove: −**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

Proof:

[Take given term]

[2.0] **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[2.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{funcstart_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[2.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <

asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1)) && (0 <
asType<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, &**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M2))) &&
(0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
&**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>($\$heap_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[2.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.30] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.31] (((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.34] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, &**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**)).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.M3))

→ *[Dereference address-of object]*

[2.35] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**asType<integer>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.M3))

→ *[simplify]*

[2.36] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType<integer>**($\$heap_{funcstart_790,1}$.M3))

→ *[const static or extern object]*

[2.37] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType<integer>**($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[2.38] ((-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[2.46] (-30323 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2) ∧ (-30269 <

$-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2) $\wedge$ (0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

$\rightarrow$ *[separate conjunction and work on first sub-term]*

[2.47] -30323 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Work on sub-term 6 of conjunction in term 2.46]

[7.0] 0 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

$\rightarrow$ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

$\rightarrow$ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

$\rightarrow$ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

$\rightarrow$ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

$\rightarrow$ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

$\rightarrow$ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

$\rightarrow$ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[43.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[expand definition of operator './' in class 'int' at built in declaration]*

[43.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[43.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.7.0] -2 < (0 + 0)

→ *[simplify]*

[43.7.2] **true**

[43.8] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.11] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[from term 7.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[43.11.0] -2 < (0 + 0)

→ *[simplify]*

[43.11.2] **true**

[43.12] ([**false**]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178), [!**false**]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) / 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[43.17] 0 == (−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot + (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 / 178))

[Assume known post-assertion, class invariant or type constraint for term 40.7]

[44.0] (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % **asType**<**integer**>(178)) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.2] (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[expand definition of operator '.%' in class 'int' at built in declaration]*

[44.3] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), []: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[44.4] ([**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0]: −(−**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178), [!(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) < 0)]: **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3) % 178) == **asType**<**integer**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)

→ *[simplify]*

[44.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3]:

$-(-\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178),\ [!(\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3}) < 0)]:\ \mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178) == \mathbf{asType}<\mathbf{integer}>(\mathrm{div}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1},\ \mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3},\ 178).\mathrm{rem})$

→ *[from term 7.0, literala* $< -\mathbf{this}.\$r.\mathbf{value}(\mathbf{heapIs}\ \$heap_{funcstart_790,1}).p3$ *is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.7.0] -2 < (0 + 0)

→ *[simplify]*

[44.7.2] **true**

[44.8] $([\mathbf{false}]:\ -(-\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178),\ [!(\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3}) < 0)]:\ \mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178) == \mathbf{asType}<\mathbf{integer}>(\mathrm{div}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1},\ \mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3},\ 178).\mathrm{rem})$

→ *[simplify]*

[44.11] $([\mathbf{false}]:\ -(-\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178),\ [!(0 < -\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})]:\ \mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178) == \mathbf{asType}<\mathbf{integer}>(\mathrm{div}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1},\ \mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3},\ 178).\mathrm{rem})$

→ *[from term 7.0, literala* $< -\mathbf{this}.\$r.\mathbf{value}(\mathbf{heapIs}\ \$heap_{funcstart_790,1}).p3$ *is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[44.11.0] -2 < (0 + 0)

→ *[simplify]*

[44.11.2] **true**

[44.12] $([\mathbf{false}]:\ -(-\mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178),\ [!\mathbf{false}]:\ \mathbf{asType}<\mathbf{integer}>(\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3})\ \%\ 178) == \mathbf{asType}<\mathbf{integer}>(\mathrm{div}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1},\ \mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3},\ 178).\mathrm{rem})$

→ *[simplify]*

[44.17] $0 == (-\mathrm{div}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1},\ \mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3},\ 178).\mathrm{rem} + (\mathbf{this}.\$\mathrm{r}.\mathbf{value}(\mathbf{heapIs}\ \$\mathrm{heap}_{funcstart_790,1}).\mathrm{p3}\ \%\ 178))$

[Take given term]

[56.0] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.2] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($\$heap_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177)]*

[56.10] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($\$heap_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) *

asType<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType<short int>**((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType<int>**($heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType<short int>**((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType<int>**($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs***

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short**

int>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] −**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to*

*$heap*$_{funcstart_790,1}$.**_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → *((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → *((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2* → *((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → *((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2* → *((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3* → *(-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))]

[1.1] −**asType<integer const>**($heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[const member of object with modified fields]*

[1.4] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[const static or extern object]*

[1.5] −**asType**<**integer const**>($heap$_{init}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.6] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30323)) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[simplify]*

[1.10] -30323 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.11] -30323 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p3)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.12] -30323 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.13] -30323 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.14] -30323 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)

→ *[simplify]*

[1.18] -30323 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

→ *[negate goal and search for contradiction]*

[1.19] !(-30323 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))

→ *[simplify]*

[1.24] 30322 < ((63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Copy term 1.24]

[95.0] 30322 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

→ *[from term 44.17, div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem is equal to* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3 % 178]*

[95.1] 30322 < ((-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Create new term from term 43.17 using rule: condition for equality of division]

[153.0] ((178 * (0 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))) < (1 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 < (178 * (0 + 1 + −(−div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))))

→ *[simplify]*

[153.15] (-1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)) ∧ (-178 < (−**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 + (178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)))

[Work on sub-term 2 of conjunction in term 153.15]

[154.0] -1 < ((-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3)

[Create new term from terms 154.0, 2.47 using rule: transitivity 2]

[165.0] (-30323 + -1 + 1) < (-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[simplify]*

[165.1] -30323 < (-178 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

→ *[literal comparison of product]*

[165.2] ([-178 < 0]: (-30323 / 178) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [0 < -178]: (-30323 / -178) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [-178 == 0]: -30323 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[165.3] ([-178 < 0]: (-30323 / 178) < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(0 < -178) ∧ !(-178 < 0)]: (-30323 / -178) < div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot, [(-178 == 0) ∧ !(-178 < 0) ∧ !(0 < -178)]: -30323 < 0)

→ *[simplify]*

[165.7] -171 < −div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot

[Create new term from terms 165.7, 95.1 using rule: transitivity 5]

[168.0] 30322 < ((-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178)) + (63 * −(-171 + 1)))

→ *[simplify]*

[168.5] 19612 < (-170 * (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178))

→ *[literal comparison of product]*

[168.6] ([-170 < 0]: (19612 / 170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [0 < -170]: (19612 / -170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [-170 == 0]: 19612 < 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[168.7] ([-170 < 0]: (19612 / 170) < −(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(0 < -170) ∧ !(-170 < 0)]: (19612 / -170) < (**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3 % 178), [(-170 == 0) ∧ !(-170 < 0) ∧ !(0 < -170)]: 19612 < 0)

→ *[simplify]*

[168.12] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,17)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$*).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[57.0] −**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[57.1] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const member of object with modified fields]*

[57.2] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const static or extern object]*

[57.3] −**asType**<**integer const**>($heap$_{init}$.M1) <

asType<integer>(operator*(heapIs $heap$_{790,1;808,8}$, **this**).p1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[57.4] −**asType<integer const>(asType<short int>((int)**30269)) < **asType<integer>(operator*(heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[simplify]*

[57.8] -30269 < **asType<integer>(operator*(heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.__replace(this.$r → this.$r.value(heapIs $heap$_{funcstart_790,1}$).__replace(p1 → (-2 * div(heapIs $heap$_{funcstart_790,1}$, this.$r.value(heapIs $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(heapIs $heap$_{funcstart_790,1}$, this.$r.value(heapIs $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[57.9] -30269 < **asType<integer>(operator*(heapIs** $heap$_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[57.10] -30269 < **asType<integer>(this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__replace(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1)

→ *[evaluate dereferenced pointer into modified heap]*

[57.11] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[57.12] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[simplify]*

[57.16] -30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem *

asType<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(p1 → (-2 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *

asType<int>($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short**
int>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *
asType<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short**
int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r ==
this.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
(-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r ==
this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short**
int>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *
asType<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short**
int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) −

(**asType**<**int**>(**asType**<**short int**>(div3.quot)) *
asType<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**
int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) −
(**asType**<**int**>(**asType**<**short int**>(div3.quot)) *
asType<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).rem))).*_**replace**(*p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p3, 178).rem)))]*

[1.2] -32768 ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.3] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1

→ *[evaluate dereferenced pointer into modified heap]*

[1.4] -32768 ≤ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.5] -32768 ≤ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1

→ *[simplify]*

[1.12] -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 57.16, literala < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.12.0] (-32769 + -1) < -30269

→ *[simplify]*

[1.12.2] **true**

[1.13] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,17)

Condition defined at:

To prove: **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1 ≤ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) ==

asType<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) *

asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[59.0] **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.1] **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[59.2] **asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[evaluate dereferenced pointer into modified heap]*

[59.3] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[59.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[simplify]*

[59.8] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[59.9] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).M1)

→ *[const member of object with modified fields]*

[59.10] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1)

→ *[const static or extern object]*

[59.11] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{init}$.M1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[59.12] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30269))

→ *[simplify]*

[59.22] -30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r ==

this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short**

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1 ≤ **maxof**(**int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.1] **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))), **this**).p1 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1 ≤ **maxof**(**int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1 ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1 ≤ **maxof**(**int**)

→ *[simplify]*

[1.23] -32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[from term 59.22, literala < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.23.0] (-32768 + -1) < -30269

→ *[simplify]*

[1.23.2] **true**

[1.24] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,11)

Condition defined at:

To prove: minof(int) ≤ **static_cast<integer>(asType<int>(operator*(heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType<int>**(**asType<short int>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**(**asType<short int>**((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[58.0] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$._**replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**)._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$._**replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs*

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**)._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$))._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *

asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.8] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.19] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**

int>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)

→ *[simplify]*

[1.1] -32768 ≤ **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)

→ *[from term 64.32, $\$heap_{790,1;812,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem))).**_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).rem))))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem))).**_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).rem))).**_replace**(*p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p3, 178).rem)))]

[1.2] -32768 ≤ **static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.3] -32768 ≤ **static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0)

→ *[evaluate dereferenced pointer into modified heap]*

[1.4] -32768 ≤ **static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.5] -32768 ≤ **static_cast<integer>(asType<int>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) < (**int**)0)

→ *[simplify]*

[1.19] -32768 ≤ ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.20] -32768 ≤ ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)

→ *[simplify]*

[1.25] -32768 ≤ ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 0)

→ *[from term 58.8, -1 < ((-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem))]*

[1.26] -32768 ≤ ([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: 0)

→ *[simplify]*

[1.28] -32769 < ([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: 0)

→ *[move guard outside expression]*

[1.29] ([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: -32769 < 1, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: -32769 < 0)

→ *[simplify]*

[1.31] ([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.32] **true**

Proof of verification condition: Type constraint satisfied in explicit

conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,11)

Condition defined at:

To prove: **static_cast<integer>(asType<int>(operator*(heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0) ≤ **maxof(int)**

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType<short int>**((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[58.0] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[60.0] $\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to*

*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1 → (-2 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).quot) + (171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs***

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0) ≤ **maxof**(**int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.1] **static_cast<integer>**(**asType<int>**(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0) ≤ **maxof**(**int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] **static_cast<integer>**(**asType<int>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))))).p1) < (**int**)0) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] **static_cast<integer>**(**asType<int>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.18] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.19] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.24] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0) ≤ **maxof**(**int**)

→ *[from term 58.8, -1 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]*

[1.25] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.27] (-1 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) < 32767

→ *[move guard outside expression]*

[1.28] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -1 + 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1 + 0) < 32767

→ *[simplify]*

[1.31] 0 < (32767 + −([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1))

→ *[move guard outside expression]*

[1.32] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: −0, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: −-1))

→ *[simplify]*

[1.34] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 1))

→ *[move guard outside expression]*

[1.35] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0 + 32767, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))]: 1 + 32767)

→ *[simplify]*

[1.37] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 32767, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 32768)

→ *[move guard outside expression]*

[1.38] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0 < 32767, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 < 32768)

→ *[simplify]*

[1.40] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.41] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,27)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{790,1;812,8}$.M1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem)))).***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p2, 176).rem)))]

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{790,1;812,8}$.M1

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{790,1;812,8}$.M1

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.2] -32768 ≤ $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M1

→ *[const member of object with modified fields]*

[1.5] -32768 ≤ $heap$_{funcstart_790,1}$.M1

→ *[const static or extern object]*

[1.6] -32768 ≤ $heap$_{init}$.M1

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.7] -32768 ≤ **asType**<**short int**>((**int**)30269)

→ *[simplify]*

[1.10] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,27)

Condition defined at:

To prove: $heap$_{790,1;812,8}$.M1 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==

asType<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2),

asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r ==

this.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))))*.**_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))*.**_replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**

int>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] $\$heap_{790,1;812,8}$.M1 ≤ **maxof**(**int**)

→ *[from term 64.32, $\$heap_{790,1;812,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[1.1] $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).M1 ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.4] $heap$_{funcstart_790,1}$.M1 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.5] $heap$_{init}$.M1 $\leq$ **maxof**(**int**)

$\rightarrow$ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.6] **asType**<**short int**>((**int**)30269) $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.10] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,25)

Condition defined at:

To prove: minof(**int**) $\leq$ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0
== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 ==
asType<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *
asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short
int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs**
$heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *
asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short
int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) <
asType<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs**
$heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *
asType<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short
int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[58.0] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[60.0] $\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(***heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178)]*

[64.8] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → (*(-2 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).quot) + (171 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → (*(-2 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).quot) + (171 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).rem))).*_**replace**(*p2* → (*-35 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176).quot) + (172 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.19] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p2, 176).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.2] -32768 ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.3] -32768 ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[evaluate dereferenced pointer into modified heap]*

[1.4] -32768 ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.5] -32768 ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[simplify]*

[1.19] -32768 ≤ (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.20] -32768 ≤ (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[simplify]*

[1.25] -32768 ≤ (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[from term 58.8, -1 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))]*

[1.26] -32768 ≤ (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[simplify]*

[1.27] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{790,1;812,8}$.M1))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs***

*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.28] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M1))

→ *[const member of object with modified fields]*

[1.31] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{funcstart_790,1}$.M1))

→ *[const static or extern object]*

[1.32] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{init}$.M1))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.33] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30269)))

→ *[simplify]*

[1.36] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * 30269)

→ *[move guard outside expression]*

[1.37] -32768 ≤ ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1 * 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 * 30269)

→ *[simplify]*

[1.41] -32769 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)

→ *[move guard outside expression]*

[1.42] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -32769 < 30269,

[0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -32769 < 0)

→ *[simplify]*

[1.44] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.45] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,25)

Condition defined at:

To prove:
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType<int>**(**asType<short int>**(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType<int>**(**asType<short int>**((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[58.0] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$._**replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**)._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$._**replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs*

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**)._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$))._**replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *

asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to* *$heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.8] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.19] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**

int>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0]
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[from term 64.32, $\$heap_{790,1;812,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs***

$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[1.1]
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)) *
asType<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2]
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.18] (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.19] (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.24] (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[from term 58.8, -1 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]*

[1.25] (**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.26] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) ≤ **maxof**(**int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.27] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).M1)) ≤ **maxof**(**int**)

→ *[const member of object with modified fields]*

[1.30] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{funcstart_790,1}$.M1)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.31] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{init}$.M1)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.32] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30269))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.35] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * 30269) ≤ **maxof**(**int**)

→ *[move guard outside expression]*

[1.36] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1 * 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 * 30269) ≤ **maxof**(**int**)

→ *[simplify]*

[1.40] (-1 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) < 32767

→ *[move guard outside expression]*

[1.41] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -1 + 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1 + 0) < 32767

→ *[simplify]*

[1.44] 0 < (32767 + −([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30268, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1))

→ *[move guard outside expression]*

[1.45] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: −30268, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: −-1))

→ *[simplify]*

[1.47] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -30268, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 1))

→ *[move guard outside expression]*

[1.48] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -30268 + 32767, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 1 + 32767)

→ *[simplify]*

[1.50] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 2499, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 32768)

→ *[move guard outside expression]*

[1.51] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0 < 2499, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 < 32768)

→ *[simplify]*

[1.53] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.54] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,5)

Condition defined at:

To prove: **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value***(***heapIs** *$heap*$_{funcstart_790,1}$*).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[57.0] −**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[57.1] −**asType**<**integer const**>($\$heap_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__replace(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[const member of object with modified fields]*

[57.2] −**asType**<**integer const**>($\$heap_{funcstart_790,1}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[const static or extern object]*

[57.3] −**asType**<**integer const**>($\$heap_{init}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[57.4] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30269)) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[simplify]*

[57.8] -30269 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[57.9] -30269 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$.__replace(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__replace(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).p1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[57.10] -30269 < **asType<integer>(this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1)

→ *[evaluate dereferenced pointer into modified heap]*

[57.11] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[57.12] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[simplify]*

[57.16] -30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>(asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>(asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r ==

this.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → (*(-2 * div*(**heapIs** *$heap$_{funcstart_790,1}$*,
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).quot) + (171 *
div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1, 177).rem))))*.*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → (*(-2 * div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177).quot)*
*+ (171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1, 177).rem)))*.*_**replace**(*p2* → (*-35 * div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176).quot)*
*+ (172 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(p3 → **asType**<**short
int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem *
asType<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.19] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1

→ *[from term 64.32,* $heap$_{790,1;812,8}$ *is equal to* $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace***(p3 → (-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.2] -32768 ≤ **operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.3] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1

→ *[evaluate dereferenced pointer into modified heap]*

[1.4] -32768 ≤ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.5] -32768 ≤ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1

→ *[simplify]*

[1.12] -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[from term 57.16, literala < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.12.0] (-32769 + -1) < -30269

→ *[simplify]*

[1.12.2] **true**

[1.13] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,5)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),

asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<int>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3),
asType<int>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value(heapIs** *$heap*$_{funcstart_790,1}$*).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) *

asType<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[59.0] **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.1] **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[59.2] **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

→ *[evaluate dereferenced pointer into modified heap]*

[59.3] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[59.4] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).__**replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType<integer>**($heap$_{790,1;808,8}$.M1)

→ *[simplify]*

[59.8] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.9] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1)

→ *[const member of object with modified fields]*

[59.10] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1)

→ *[const static or extern object]*

[59.11] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{init}$.M1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[59.12] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30269))

→ *[simplify]*

[59.22] -30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []:

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r* → ***this***.$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs*** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, ***this***.$r.***value***(***heapIs***

$heap$_{funcstart_790,1}$).p1, 177).rem)))]

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.8] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType<short int>**((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1 ≤ **maxof**(**int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem))))***._replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))).***_replace**(*p3 → (-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem)))]*

[1.1] **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1 ≤ **maxof**(**int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1 ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1 ≤ **maxof**(**int**)

→ *[simplify]*

[1.23] -32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[from term 59.22, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.23.0] (-32768 + -1) < -30269

→ *[simplify]*

[1.23.2] **true**

[1.24] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,8)

Condition defined at:

To prove: minof(short int) $\leq$
((**asType<int>(static_cast<integer>(asType<int>(operator*(heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($\$heap_{790,1;812,8}$.M1)) + **asType<int>(operator*(heapIs** $\$heap_{790,1;812,8}$, **this**).p1))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType<short int>**((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType<short int>**((**int**)63)

operator*(heapIs $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>(asType<int>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>(asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>(asType<int>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>(asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType<integer>(operator*(heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, **asType**<**int**>($\$heap_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>($\$heap_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, **asType**<**int**>(**asType**<**short int**>((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3), **asType**<**int**>($\$heap_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[57.0] −**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[57.1] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const member of object with modified fields]*

[57.2] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const static or extern object]*

[57.3] −**asType**<**integer const**>($heap$_{init}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[57.4] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30269)) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[simplify]*

[57.8] -30269 < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[57.9] -30269 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[57.10] -30269 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1)

→ *[evaluate dereferenced pointer into modified heap]*

[57.11] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[57.12] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[simplify]*

[57.16] -30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Take given term]

[58.0] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$,

this).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short**

int>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$\$heap_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.***_replace**(***this***.*$r* → **this**.*$r*.**value**(***heapIs*** *$\$heap_{funcstart_790,1}$).***_replace***(p1 → (-2 * div(***heapIs*** *$\$heap_{funcstart_790,1}$,* **this**.*$r*.**value**(***heapIs*** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short**

int>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short**

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short**

int>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short**

int>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0] **minof**(**short int**) ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.1] -32768 ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))

→ *[from term 64.32, $\$heap_{790,1;812,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))]*

[1.2] -32768 ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.3] -32768 ≤
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[1.4] -32768 ≤
((**asType<int>**(**static_cast<integer>**(**asType<int>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.5] -32768 ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.19] -32768 ≤ ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.20] -32768 ≤ ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.25] -32768 ≤ ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[from term 58.8, -1 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))]*

[1.26] -32768 ≤ ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.27] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.28] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[const member of object with modified fields]*

[1.31] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{funcstart_790,1}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[const static or extern object]*

[1.32] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**($heap$_{init}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.33] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType<int>**(**asType<short int>**((**int**)30269))) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.36] -32768 ≤ ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * 30269) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[move guard outside expression]*

[1.37] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1 * 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 * 30269) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[simplify]*

[1.39] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(*p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[1.40] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.41] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[1.42] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.43] -32768 ≤ (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1))

→ *[simplify]*

[1.50] -32768 ≤ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0))

→ *[move guard outside expression]*

[1.51] -32768 ≤ ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[simplify]*

[1.54] -32769 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

→ *[move guard outside expression]*

[1.55] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -32769 < (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[simplify]*

[1.57] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -63038 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 57.16, literala < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.57.0] (-63038 + -1) < -30269

→ *[simplify]*

[1.57.2] **true**

[1.58] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -32769 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 57.16, literala < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.58.0] (-32769 + -1) < -30269

→ *[simplify]*

[1.58.2] **true**

[1.59] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.60] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (79,8)

Condition defined at:

To prove:
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

Proof:

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<int>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, **asType<int>**(**asType<short int>**((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**(**asType<short int>**((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($heap$_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType<short**

int>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[58.0] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[59.0] **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.1] **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[59.2] **asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[evaluate dereferenced pointer into modified heap]*

[59.3] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[59.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$)).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[simplify]*

[59.8] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[59.9] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).M1)

→ *[const member of object with modified fields]*

[59.10] ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1)

→ *[const static or extern object]*

[59.11] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{init}$.M1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[59.12] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30269))

→ *[simplify]*

[59.22] -30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($heap$_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.18] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[64.0] $heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r ==

this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.8] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to* $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short**

int>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($\$heap_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take goal term]

[1.0]
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.1]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.3] ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.4] ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.18] ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.19] ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.24] ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[from term 58.8, -1 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))]*

[1.25] ((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.26] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → (-63 * div(***heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[1.27] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[const member of object with modified fields]*

[1.30] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{funcstart_790,1}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.31] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{init}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.32] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30269))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.35] ((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * 30269) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[move guard outside expression]*

[1.36] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1 * 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 * 30269) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.38] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) +
asType<int>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1)) ≤
maxof(**short int**)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))))*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem)))*_**replace**(*p2 → ((-35 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))))*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem)))*_**replace**(*p2 → ((-35 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem)))*_**replace**(*p3 → (-63 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[1.39] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) +
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.40] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1)) ≤ **maxof**(**short int**)

→ *[evaluate dereferenced pointer into modified heap]*

[1.41] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) +
asType<int>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1,
177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2,
176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)),
[]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).p1)) ≤ **maxof**(**short int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.42] (([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) +
asType<int>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.49] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) ≤ **maxof**(**short int**)

→ *[move guard outside expression]*

[1.50] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.53] (-1 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: (-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) < 32767

→ *[move guard outside expression]*

[1.54] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -1 + (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1 + ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) < 32767

→ *[simplify]*

[1.58] 0 < (32767 + −([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30268 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -1 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[move guard outside expression]*

[1.59] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: −(30268 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: −(-1 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

→ *[simplify]*

[1.71] 0 < (32767 + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -30268 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 1 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[move guard outside expression]*

[1.72] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 32767 + (-30268 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 32767 + (1 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[simplify]*

[1.76] 0 < ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 2499 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 32768 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

→ *[move guard outside expression]*

[1.77] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 0 < (2499 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 < (32768 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[simplify]*

[1.79] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: -2499 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 < (32768 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[from guard, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.79.0] (-2499 + -1) < 0

→ *[simplify]*

[1.79.2] **true**

[1.80] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 < (32768 + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[simplify]*

[1.82] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: -32768 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))

→ *[from term 59.22, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.82.0] (-32768 + -1) < -30269

→ *[simplify]*

[1.82.2] **true**

[1.83] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: **true**, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: **true**)

→ *[all guards have equal guarded terms]*

[1.84] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,17)

Condition defined at:

To prove: **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[negate goal and search for contradiction]*

[1.5] !(-32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.7] 32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.7]

[69.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[simplify]*

[69.3] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[from term 1.7, literala* < **this**.*$r*.**value**(**heapIs** *$heap$_{790,1;815,8}$).p2 is false*

whenever -2 < (32768 + literala)]

Proof of rule precondition:

[69.3.0] -2 < (-32769 + 32768)

→ *[simplify]*

[69.3.2] **true**

[69.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,17)

Condition defined at:

To prove: **operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2 ≤ **maxof**(**int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

this).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <

asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0
== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 ==
asType<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) *
asType<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short
int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs**
$heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) *
asType<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short
int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) <
asType<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs**
$heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short
int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *
asType<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short
int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs**

$heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[negate goal and search for contradiction]*

[1.11] !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.14] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.14]

[69.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 ≤ **maxof**(**short int**)

→ *[simplify]*

[69.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[from term 1.14, literala < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[69.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[69.9.2] **true**

[69.10] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,11)

Condition defined at:

To prove: **minof**(**int**) ≤

static_cast<integer>(asType<int>(operator*(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType<short int>**((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p2), **asType<int>**($\$heap_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($\$heap_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType<int>**($\$heap_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3) < **asType<integer>**($\$heap_{funcstart_790,1}$.a3)) => (**asType<integer>**(div3.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a3) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType<integer>**(div3.quot))

!(0 == **asType<integer>**(div3.rem)) || !(0 == **asType<integer>**(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**asType<short int>**(div1.rem)) * **asType<int>**($\$heap_{funcstart_790,1}$.r1)) − (**asType<int>**(**asType<short int>**(div1.quot)) * **asType<int>**($\$heap_{funcstart_790,1}$.b1)))))

−**asType<integer const>**($\$heap_{790,1;808,8}$.M1) < **asType<integer>**(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)

→ *[simplify]*

[1.1] -32768 ≤ **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) < (**int**)0)

→ *[simplify]*

[1.7] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, []: 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)]: 0)

→ *[simplify]*

[1.13] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0)

→ *[move guard outside expression]*

[1.14] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < 0)

→ *[simplify]*

[1.16] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**)

→ *[all guards have equal guarded terms]*

[1.17] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,11)

Condition defined at:

To prove: **static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) < (**int**)0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, []: 0) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)]: 0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.12] (-1 + ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0)) < 32767

→ *[move guard outside expression]*

[1.13] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: -1 + 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: -1 + 0) < 32767

→ *[simplify]*

[1.16] 0 < (32767 + −([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: -1))

→ *[move guard outside expression]*

[1.17] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −0, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −-1))

→ *[simplify]*

[1.19] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1))

→ *[move guard outside expression]*

[1.20] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 + 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 + 32767)

→ *[simplify]*

[1.22] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32768)

→ *[move guard outside expression]*

[1.23] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < 32768)

→ *[simplify]*

[1.25] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**)

→ *[all guards have equal guarded terms]*

[1.26] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,27)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{790,1;815,8}$.M2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof(int)** ≤ $heap$_{790,1;815,8}$.M2

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{790,1;815,8}$.M2

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.M2

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.3] -32768 ≤ **asType<short int>**((**int**)30307)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,27)

Condition defined at:

To prove: $heap$_{790,1;815,8}$.M2 ≤ **maxof(int)**

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <

asType<integer>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] $heap$_{790,1;815,8}$.M2 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.M2 ≤ **maxof**(**int**)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.2] **asType<short int>**((**int**)30307) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,25)

Condition defined at:

To prove: minof(int) $\leq$ (**asType<int>(static_cast<integer>(asType<int>(operator*(heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($\$heap_{790,1;815,8}$.M2))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType<short int>**((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[simplify]*

[1.1] -32768 ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ (**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[simplify]*

[1.7] -32768 ≤ (**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ (**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)]: 0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[simplify]*

[1.12] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($heap$_{790,1;815,8}$.M2))

→ *[const static or extern object]*

[1.13] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($heap$_{init}$.M2))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.14] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30307)))

→ *[simplify]*

[1.17] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * 30307)

→ *[move guard outside expression]*

[1.18] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 * 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 * 30307)

→ *[simplify]*

[1.22] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0)

→ *[move guard outside expression]*

[1.23] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < 30307, [-1

< **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < 0)

→ *[simplify]*

[1.25] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**)

→ *[all guards have equal guarded terms]*

[1.26] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,25)

Condition defined at:

To prove:
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType<int>**($\$heap_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($\$heap_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3), **asType<int>**($\$heap_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a3))) ==

asType<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <

asType<integer>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0]
(**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1]
(**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] (**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, []: 0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] (**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)]: 0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**($heap$_{790,1;815,8}$.M2)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.12] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**($heap$_{init}$.M2)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.13] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**(**asType<short int>**((**int**)30307))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.16] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 <

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * 30307) ≤ **maxof**(**int**)

→ *[move guard outside expression]*

[1.17] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 * 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 * 30307) ≤ **maxof**(**int**)

→ *[simplify]*

[1.21] (-1 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0)) < 32767

→ *[move guard outside expression]*

[1.22] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1 + 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1 + 0) < 32767

→ *[simplify]*

[1.25] 0 < (32767 + −([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30306, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1))

→ *[move guard outside expression]*

[1.26] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −30306, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −-1))

→ *[simplify]*

[1.28] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -30306, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1))

→ *[move guard outside expression]*

[1.29] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -30306 + 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 + 32767)

→ *[simplify]*

[1.31] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 2461, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32768)

→ *[move guard outside expression]*

[1.32] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < 2461, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < 32768)

→ *[simplify]*

[1.34] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**)

→ *[all guards have equal guarded terms]*

[1.35] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at:
C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,5)

Condition defined at:

To prove: **minof**(**int**) $\leq$ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short**

int>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) <
asType<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[negate goal and search for contradiction]*

[1.5] !(-32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.7] 32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.7]

[69.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[simplify]*

[69.3] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[from term 1.7, literala* < **this**.*$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2 is false whenever -2 < (32768 + literala)]*

Proof of rule precondition:

[69.3.0] -2 < (-32769 + 32768)

→ *[simplify]*

[69.3.2] **true**

[69.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,5)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[negate goal and search for contradiction]*

[1.11] !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.14] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.14]

[69.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 ≤ **maxof**(**short int**)

→ *[simplify]*

[69.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[from term 1.14, literala < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[69.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[69.9.2] **true**

[69.10] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,8)

Condition defined at:

To prove: **minof**(**short int**) ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0] **minof**(**short int**) ≤
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[simplify]*

[1.1] -32768 ≤
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[simplify]*

[1.7] -32768 ≤ ((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, []: 0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ ((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)]: 0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[simplify]*

[1.12] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[const static or extern object]*

[1.13] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($\$heap_{init}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.14] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 <

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30307))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))

→ *[simplify]*

[1.17] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * 30307) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))

→ *[move guard outside expression]*

[1.18] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 * 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 * 30307) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))

→ *[simplify]*

[1.20] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.21] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[simplify]*

[1.22] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[move guard outside expression]*

[1.23] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.26] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[move guard outside expression]*

[1.27] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[simplify]*

[1.29] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -63076 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).p2]: -32769 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)

→ *[from guard, literala* < **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;815,8}$*).p2 is true whenever (-1 + literala) < -1]*

Proof of rule precondition:

[1.29.0] (-32769 + -1) < -1

→ *[simplify]*

[1.29.2] **true**

[1.30] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: -63076 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: **true**)

→ *[negate goal and search for contradiction]*

[1.31] !([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: -63076 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: **true**)

→ *[move guard outside expression]*

[1.32] ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: !(-63076 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: !**true**)

→ *[simplify]*

[1.37] (0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∧ (63075 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)

[Work on sub-term 2 of conjunction in term 1.37]

[69.0] 63075 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.37]

[70.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2

→ *[simplify]*

[70.3] -32769 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2

→ *[from term 69.0, literala* < **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;815,8}$*).p2 is false whenever -2 < (63075 + literala)]*

Proof of rule precondition:

[70.3.0] -2 < (-32769 + 63075)

→ *[simplify]*

[70.3.2] **true**

[70.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (80,8)

Condition defined at:

To prove:
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.a1)) =>
(**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0
== **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 ==
asType<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) ==
asType<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) ==
asType<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.a2)) =>
(**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0
== **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==
asType<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) ==
asType<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) ==
asType<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0
== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

Proof:

[Take goal term]

[1.0]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.6] ((**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, []: 0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] ((**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)]: 0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.11] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.12] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**($heap$_{init}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.13] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType<int>**(**asType<short int>**((**int**)30307))) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.16] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * 30307) +

asType<int>(operator*(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[move guard outside expression]*

[1.17] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 * 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 * 30307) + **asType<int>(operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.19] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType<int>(operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.20] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType<int>(this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.21] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ≤ **maxof**(**short int**)

→ *[move guard outside expression]*

[1.22] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.25] (-1 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)) < 32767

→ *[move guard outside expression]*

[1.26] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1 + (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) < 32767

→ *[simplify]*

[1.29] 0 < (32767 + −([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30306 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -1 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[move guard outside expression]*

[1.30] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −(30306 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: −(-1 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))

→ *[simplify]*

[1.34] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -30306 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[move guard outside expression]*

[1.35] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32767 + (-30306 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32767 + (1 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[simplify]*

[1.39] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 2461 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[move guard outside expression]*

[1.40] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < (2461 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[simplify]*

[1.42] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -2461 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[from guard, literala < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.42.0] (-2461 + -1) < 0

→ *[simplify]*

[1.42.2] **true**

[1.43] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[simplify]*

[1.45] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[negate goal and search for contradiction]*

[1.46] !([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[move guard outside expression]*

[1.47] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: !**true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

→ *[simplify]*

[1.53] (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∧ (32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Work on sub-term 2 of conjunction in term 1.53]

[69.0] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

[Assume known post-assertion, class invariant or type constraint for term 1.53]

[70.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 ≤ **maxof**(**short int**)

→ *[simplify]*

[70.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2

→ *[from term 69.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[70.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[70.9.2] **true**

[70.10] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,17)

Condition defined at:

To prove: **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <

asType<integer>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[negate goal and search for contradiction]*

[1.5] !(-32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.7] 32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.7]

[72.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[simplify]*

[72.3] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 1.7, literala* < **this**.*$r*.**value***(***heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (32768 + literala)]*

Proof of rule precondition:

[72.3.0] -2 < (-32769 + 32768)

→ *[simplify]*

[72.3.2] **true**

[72.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,17)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[negate goal and search for contradiction]*

[1.11] !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.14] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.14]

[72.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 ≤ **maxof**(**short int**)

→ *[simplify]*

[72.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 1.14, literala* < −**this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;816,8}$).*p3 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[72.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[72.9.2] **true**

[72.10] **false**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,11)

Condition defined at:

To prove: **minof**(**int**) ≤ **static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) ==

asType<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <

asType<integer>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)

→ *[simplify]*

[1.1] -32768 ≤ **static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0)

→ *[simplify]*

[1.7] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0)

→ *[simplify]*

[1.13] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0)

→ *[move guard outside expression]*

[1.14] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < 0)

→ *[simplify]*

[1.16] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[all guards have equal guarded terms]*

[1.17] **true**

Proof of verification condition: Type constraint satisfied in explicit conversion from 'integer' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,11)

Condition defined at:

To prove: **static_cast<integer>(asType<int>(operator*(heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0) ≤ **maxof(int)**

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType<short int>**((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs**

$heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

$\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **static_cast<integer>(asType<int>(operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **static_cast<integer>(asType<int>(this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0) ≤ **maxof**(**int**)

→ *[simplify]*

[1.12] (-1 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0)) < 32767

→ *[move guard outside expression]*

[1.13] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1 + 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1 + 0) < 32767

→ *[simplify]*

[1.16] 0 < (32767 + −([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1))

→ *[move guard outside expression]*

[1.17] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: −0, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: −-1))

→ *[simplify]*

[1.19] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1))

→ *[move guard outside expression]*

[1.20] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 + 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 + 32767)

→ *[simplify]*

[1.22] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 32768)

→ *[move guard outside expression]*

[1.23] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < 32768)

→ *[simplify]*

[1.25] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[all guards have equal guarded terms]*

[1.26] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,27)

Condition defined at:

To prove: **minof**(**int**) ≤ $heap$_{790,1;816,8}$.M3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ $heap$_{790,1;816,8}$.M3

→ *[simplify]*

[1.1] -32768 ≤ $heap$_{790,1;816,8}$.M3

→ *[const static or extern object]*

[1.2] -32768 ≤ $heap$_{init}$.M3

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.3] -32768 ≤ **asType**<**short int**>((**int**)30323)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int const' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,27)

Condition defined at:

To prove: $heap$_{790,1;816,8}$.M3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] $heap$_{790,1;816,8}$.M3 ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.1] $heap$_{init}$.M3 ≤ **maxof**(**int**)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.2] **asType<short int>**((**int**)30323) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,25)

Condition defined at:

To prove: minof(int) $\leq$ (**asType<int>(static_cast<integer>(asType<int>(operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType<int>**($\$heap_{790,1;816,8}$.M3))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType<short int>**((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType<short int>**((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType<short int>**((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType<short int>**((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType<short int>**((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType<short int>**((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType<short int>**((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType<short int>**((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType<short int>**((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType<short int>**((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType<short int>**((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType<int>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType<int>**($\$heap_{funcstart_790,1}$.a1))

(**asType<integer>(asType<int>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType<integer>(asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>(asType<int>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType<integer>(asType<int>**($\$heap_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($\$heap_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType<integer>(operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 ==

asType<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <
asType<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) <
asType<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[simplify]*

[1.1] -32768 ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[simplify]*

[1.7] -32768 ≤ (**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, []: 0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ (**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)]: 0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[simplify]*

[1.12] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3))

→ *[const static or extern object]*

[1.13] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.14] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[1.17] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0) * 30323)

→ *[move guard outside expression]*

[1.18] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 1 * 30323, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0 * 30323)

→ *[simplify]*

[1.22] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]: 0)

→ *[move guard outside expression]*

[1.23] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < 0)

→ *[simplify]*

[1.25] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[all guards have equal guarded terms]*

[1.26] **true**

Proof of verification condition: Arithmetic result of operator '*' is within limit of type 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,25)

Condition defined at:

To prove:
(**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) == **asType<integer>**(div3.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0]
(**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1]
(**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.6] (**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] (**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

→ *[simplify]*

[1.11] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType<int>**($heap$_{790,1;816,8}$.M3)) ≤ **maxof**(**int**)

→ *[const static or extern object]*

[1.12] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType<int>**($heap$_{init}$.M3)) ≤ **maxof**(**int**)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.13] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType<int>**(**asType<short int>**((**int**)30323))) ≤ **maxof**(**int**)

→ *[simplify]*

[1.16] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * 30323) ≤ **maxof**(**int**)

→ *[move guard outside expression]*

[1.17] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 * 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 * 30323) ≤ **maxof**(**int**)

→ *[simplify]*

[1.21] (-1 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0)) < 32767

→ *[move guard outside expression]*

[1.22] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1 + 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1 + 0) < 32767

→ *[simplify]*

[1.25] 0 < (32767 + −([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30322, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -1))

→ *[move guard outside expression]*

[1.26] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: −30322, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: −-1))

→ *[simplify]*

[1.28] 0 < (32767 + ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -30322, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1))

→ *[move guard outside expression]*

[1.29] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -30322 + 32767, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 + 32767)

→ *[simplify]*

[1.31] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 2445, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 32768)

→ *[move guard outside expression]*

[1.32] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < 2445, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < 32768)

→ *[simplify]*

[1.34] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[all guards have equal guarded terms]*

[1.35] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,5)

Condition defined at:

To prove: **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) <

asType<**integer**>($heap$_{funcstart_790,1}$.a1)) =>
(**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0
== **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 ==
asType<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) ==
asType<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) ==
asType<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) <
asType<**integer**>($heap$_{funcstart_790,1}$.a2)) =>
(**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0
== **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 ==
asType<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) ==
asType<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,
this).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) ==
asType<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) <
asType<**integer**>($heap$_{funcstart_790,1}$.a3)) =>
(**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤
asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0
== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof**(**int**) ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

→ *[simplify]*

[1.1] -32768 ≤ **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[simplify]*

[1.4] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[negate goal and search for contradiction]*

[1.5] !(-32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.7] 32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.7]

[72.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[simplify]*

[72.3] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 1.7, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (32768 + literala)]*

Proof of rule precondition:

[72.3.0] -2 < (-32769 + 32768)

→ *[simplify]*

[72.3.2] **true**

[72.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'short int' to 'int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,5)

Condition defined at:

To prove: **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3 ≤ **maxof**(**int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) <

asType<integer>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**asType<short int>**(div2.rem)) * **asType<int>**($heap$_{790,1;808,8}$.r2)) − (**asType<int>**(**asType<short int>**(div2.quot)) * **asType<int>**($heap$_{790,1;808,8}$.b2)))))

−**asType<integer const>**($heap$_{790,1;810,8}$.M2) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3 ≤ **maxof**(**int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1] **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 ≤ **maxof**(**int**)

→ *[simplify]*

[1.10] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[negate goal and search for contradiction]*

[1.11] !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.14] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.14]

[72.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 ≤ **maxof**(**short int**)

→ *[simplify]*

[72.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 1.14, literala* < −**this**.*$r*.**value**(**heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[72.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[72.9.2] **true**

[72.10] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,8)

Condition defined at:

To prove: **minof**(**short int**) ≤ ((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) $\leq$ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) $\leq$

asType<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0] **minof(short int)** ≤ ((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[simplify]*

[1.1] -32768 ≤ ((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.2] -32768 ≤ ((**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[simplify]*

[1.7] -32768 ≤ ((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.8] -32768 ≤ ((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[simplify]*

[1.12] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[const static or extern object]*

[1.13] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{init}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.14] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30323))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[simplify]*

[1.17] -32768 ≤ ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[move guard outside expression]*

[1.18] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 * 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[simplify]*

[1.20] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.21] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

→ *[simplify]*

[1.22] -32768 ≤ (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[move guard outside expression]*

[1.23] -32768 ≤ ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.26] -32769 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[move guard outside expression]*

[1.27] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.29] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -63092 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from guard, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{790,1;816,8}$).p3 is true whenever (-1 + literala) < -1]*

Proof of rule precondition:

[1.29.0] (-32769 + -1) < -1

→ *[simplify]*

[1.29.2] **true**

[1.30] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -63092 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[negate goal and search for contradiction]*

[1.31] !([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -63092 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**)

→ *[move guard outside expression]*

[1.32] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: !(-63092 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: !**true**)

→ *[simplify]*

[1.37] (0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∧ (63091 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Work on sub-term 2 of conjunction in term 1.37]

[72.0] 63091 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.37]

[73.0] **minof**(**short int**) ≤ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[simplify]*

[73.3] -32769 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 72.0, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (63091 + literala)]*

Proof of rule precondition:

[73.3.0] -2 < (-32769 + 63091)

→ *[simplify]*

[73.3.2] **true**

[73.4] **false**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (81,8)

Condition defined at:

To prove:
((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<integer>(operator*(heapIs $heap$_{790,1;810,8}$, **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

−**asType<integer const>**($heap$_{790,1;812,8}$.M3) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType<integer>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<integer>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace(this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType<int>**($heap$_{790,1;815,8}$.M2)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

Proof:

[Take goal term]

[1.0]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.1]
((**asType<int>**(**static_cast<integer>**(**asType<int>**(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.6] ((**asType<int>**(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0)) * **asType<int>**($heap$_{790,1;816,8}$.M3)) + **asType<int>(operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.7] ((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.11] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[const static or extern object]*

[1.12] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{init}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.13] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30323))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.16] ((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[move guard outside expression]*

[1.17] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 * 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[simplify]*

[1.19] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3)) ≤ **maxof**(**short int**)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[1.20] (([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) +

asType<int>(this.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3)) ≤ **maxof(short int**)

→ *[simplify]*

[1.21] (([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3) ≤ **maxof(short int**)

→ *[move guard outside expression]*

[1.22] ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 0 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3) ≤ **maxof(short int**)

→ *[simplify]*

[1.25] (-1 + ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3)) < 32767

→ *[move guard outside expression]*

[1.26] ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: -1 + (30323 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: -1 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3) < 32767

→ *[simplify]*

[1.29] 0 < (32767 + −([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 30322 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: -1 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3))

→ *[move guard outside expression]*

[1.30] 0 < (32767 + ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: −(30322 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: −(-1 + **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3)))

→ *[simplify]*

[1.34] 0 < (32767 + ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: -30322 + −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 1 + −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3))

→ *[move guard outside expression]*

[1.35] 0 < ([0 < −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 32767 + (-30322 + −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3]: 32767 + (1 + −**this**.$r.**value(heapIs** $heap$_{790,1;816,8}$).p3))

→ *[simplify]*

[1.39] 0 < ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 2445 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[move guard outside expression]*

[1.40] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < (2445 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

→ *[simplify]*

[1.42] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -2445 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

→ *[from guard, literala < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.42.0] (-2445 + -1) < 0

→ *[simplify]*

[1.42.2] **true**

[1.43] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 < (32768 + −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

→ *[simplify]*

[1.45] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[negate goal and search for contradiction]*

[1.46] !([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[move guard outside expression]*

[1.47] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: !**true**, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: !(-32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

→ *[simplify]*

[1.53] (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∧ (32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Work on sub-term 2 of conjunction in term 1.53]

[72.0] 32767 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

[Assume known post-assertion, class invariant or type constraint for term 1.53]

[73.0] **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3 ≤ **maxof**(**short int**)

→ *[simplify]*

[73.9] -32768 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3

→ *[from term 72.0, literala* < −**this**.*$r*.**value**(**heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (32767 + literala)]*

Proof of rule precondition:

[73.9.0] -2 < (-32768 + 32767)

→ *[simplify]*

[73.9.2] **true**

[73.10] **false**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (87,12)

To prove: operator*(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType<int>**($heap$_{funcstart_790,1}$.a1))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a1))) == **asType<integer>**(div1.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType<integer>**($heap$_{funcstart_790,1}$.a1)) => (**asType<integer>**(div1.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType<integer>**($heap$_{funcstart_790,1}$.a1) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType<integer>**(div1.quot))

!(0 == **asType<integer>**(div1.rem)) || !(0 == **asType<integer>**(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType<int>**($heap$_{funcstart_790,1}$.a2))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.quot)

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a2))) == **asType<integer>**(div2.rem)

(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType<integer>**($heap$_{funcstart_790,1}$.a2)) => (**asType<integer>**(div2.rem) == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType<integer>**($heap$_{funcstart_790,1}$.a2) ≤ **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType<integer>**(div2.quot))

!(0 == **asType<integer>**(div2.rem)) || !(0 == **asType<integer>**(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType<int>**($heap$_{funcstart_790,1}$.a3))

(**asType<integer>**(**asType<int>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType<integer>**(**asType<int>**($heap$_{funcstart_790,1}$.a3))) ==

asType<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

$heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

Proof:

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcend_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.3] (((((0 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.4] (((((0 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <

asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) &&

(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[1.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∧ (-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs**
$heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧
(0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[negate goal and search for contradiction]*

[1.47] !(-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ !(-30307 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ !(-30269 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ !(0 < **this**.$r.**value**(**heapIs**
$heap$_{funcend_790,1}$).p1) ∨ !(0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)
∨ !(0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[simplify]*

[1.62] (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30306 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30268 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs**
$heap$_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)
∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

[Take given term]

[8.0] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[8.1] div1 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1),
asType<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[simplify]*

[8.2] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

→ *[const static or extern object]*

[8.3] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>($heap$_{init}$.a1))

→ *[expand definition of constant 'a1' at prang.cpp (34,24)]*

[8.4] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, **asType**<**int**>(**asType**<**short int**>((**int**)177)))

→ *[simplify]*

[8.7] div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177)

[Take given term]

[24.0] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[24.1] div2 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2),
asType<int>($heap$_{funcstart_790,1}$.a2))

→ *[simplify]*

[24.2] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{funcstart_790,1}$.a2))

→ *[const static or extern object]*

[24.3] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**($heap$_{init}$.a2))

→ *[expand definition of constant 'a2' at prang.cpp (39,24)]*

[24.4] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, **asType<int>**(**asType<short int>**((**int**)176)))

→ *[simplify]*

[24.7] div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176)

[Take given term]

[40.0] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3),
asType<int>($heap$_{funcstart_790,1}$.a3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[40.1] div3 == div(**heapIs** $heap$_{funcstart_790,1}$,
asType<int>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3),
asType<int>($heap$_{funcstart_790,1}$.a3))

→ *[simplify]*

[40.2] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{funcstart_790,1}$.a3))

→ *[const static or extern object]*

[40.3] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType<int>**($heap$_{init}$.a3))

→ *[expand definition of constant 'a3' at prang.cpp (44,24)]*

[40.4] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, **asType**<**int**>(**asType**<**short int**>((**int**)178)))

→ *[simplify]*

[40.7] div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178)

[Take given term]

[56.0] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[56.1] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.2] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.4] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.5] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>($heap$_{init}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[expand definition of constant 'r1' at prang.cpp (33,24)]*

[56.6] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * **asType**<**int**>(**asType**<**short int**>((**int**)171))) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.9] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem * 171) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[from term 8.7, div1 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177)]*

[56.10] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[simplify]*

[56.12] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

→ *[const static or extern object]*

[56.13] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot * **asType**<**int**>($heap$_{init}$.b1)))))

→ *[expand definition of constant 'b1' at prang.cpp (35,24)]*

[56.14] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → **asType**<**short int**>((171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot *

asType<**int**>(**asType**<**short int**>((**int**)2))))))

→ *[simplify]*

[56.20] $heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Take given term]

[57.0] −**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[57.1] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const member of object with modified fields]*

[57.2] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[const static or extern object]*

[57.3] −**asType**<**integer const**>($heap$_{init}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[57.4] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30269)) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[simplify]*

[57.8] -30269 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))]

[57.9] -30269 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[57.10] -30269 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1)

→ *[evaluate dereferenced pointer into modified heap]*

[57.11] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[57.12] -30269 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1)

→ *[simplify]*

[57.16] -30269 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Take given term]

[58.0] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[58.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[58.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1))

→ *[evaluate dereferenced pointer into modified heap]*

[58.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[58.4] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1))

→ *[simplify]*

[58.8] !(0 == ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Take given term]

[59.0] **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.1] **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[59.2] **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[evaluate dereferenced pointer into modified heap]*

[59.3] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[59.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[simplify]*

[59.8] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[59.9] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).M1)

→ *[const member of object with modified fields]*

[59.10] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{funcstart_790,1}$.M1)

→ *[const static or extern object]*

[59.11] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>($heap$_{init}$.M1)

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[59.12] ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30269))

→ *[simplify]*

[59.22] -30269 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))

[Take given term]

[60.0] $heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.2] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))), **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[60.3] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[evaluate dereferenced pointer into modified heap]*

[60.4] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[60.5] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r ==

this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.7] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176)]*

[60.8] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.10] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $\$heap_{790,1;808,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))]*

[60.11] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const member of object with modified fields]*

[60.12] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{funcstart_790,1}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[const static or extern object]*

[60.13] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>($\$heap_{init}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[expand definition of constant 'r2' at prang.cpp (38,24)]*

[60.14] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * **asType**<**int**>(**asType**<**short int**>((**int**)172))) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.17] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem * 172) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

→ *[from term 24.7, div2 is equal to div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).p2, 176)]*

[60.18] $\$heap_{790,1;810,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[simplify]*

[60.20] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

→ *[from term 56.20, $heap$_{790,1;808,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[60.21] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).b2)))))

→ *[const member of object with modified fields]*

[60.22] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b2)))))

→ *[const static or extern object]*

[60.23] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot * **asType**<**int**>($heap$_{init}$.b2)))))

→ *[expand definition of constant 'b2' at prang.cpp (40,24)]*

[60.24] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **asType**<**short int**>((172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot *
asType<**int**>(**asType**<**short int**>((**int**)35))))))

→ *[simplify]*

[60.30] $heap$_{790,1;810,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))

[Take given term]

[61.0] −**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) <
asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to*
*$heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))]

[61.1] −**asType**<**integer const**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).M2) <

asType<integer>(operator*(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[const member of object with modified fields]*

[61.3] −**asType<integer const>**($heap$_{funcstart_790,1}$.M2) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[const static or extern object]*

[61.4] −**asType<integer const>**($heap$_{init}$.M2) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[61.5] −**asType<integer const>(asType<short int>**((**int**)30307)) < **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[simplify]*

[61.9] -30307 < **asType<integer>(operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[61.10] -30307 < **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).p2)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[61.11] -30307 < **asType<integer>(this**.$r.**value(heapIs**

$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2)

→ *[evaluate dereferenced pointer into modified heap]*

[61.12] -30307 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[61.13] -30307 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)

→ *[simplify]*

[61.17] -30307 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))

[Take given term]

[62.0] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[62.1] !(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).p2))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[62.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))))).p2))

→ *[evaluate dereferenced pointer into modified heap]*

[62.3] !(0 == **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[62.4] !(0 == **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2))

→ *[simplify]*

[62.8] !(0 == ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))

[Take given term]

[63.0] **asType<integer>**(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType<integer>**($\$heap_{790,1;810,8}$.M2)

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs***

$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]

[63.1] **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[63.2] **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[evaluate dereferenced pointer into modified heap]*

[63.3] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[63.4] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[simplify]*

[63.8] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType<integer>**($heap$_{790,1;810,8}$.M2)

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[63.9] ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) < **asType<integer>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).M2)

→ *[const member of object with modified fields]*

[63.11] ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.M2)

→ *[const static or extern object]*

[63.12] ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>($\$heap_{init}$.M2)

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[63.13] ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30307))

→ *[simplify]*

[63.23] -30307 < ((-172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot))

[Take given term]

[64.0] $\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.2] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))), **this**).**_replace**(p3 → **asType<short int>**((**asType<int>**(**asType<short int>**(div3.rem)) * **asType<int>**($heap$_{790,1;810,8}$.r3)) − (**asType<int>**(**asType<short int>**(div3.quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[64.3] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[evaluate dereferenced pointer into modified heap]*

[64.4] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[64.5] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.7] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178)]*

[64.8] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.10] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $\$heap_{790,1;810,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))]*

[64.11] $\$heap_{790,1;812,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem *
asType<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const member of object with modified fields]*

[64.13] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{funcstart_790,1}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[const static or extern object]*

[64.14] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>($heap$_{init}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[expand definition of constant 'r3' at prang.cpp (43,24)]*

[64.15] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * **asType**<**int**>(**asType**<**short int**>((**int**)170))) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.18] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem * 170) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

→ *[from term 40.7, div3 is equal to div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178)]*

[64.19] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (**asType**<**int**>(**asType**<**short int**>(div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot)) * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[simplify]*

[64.21] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType<short int>**((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType<int>**($heap$_{790,1;810,8}$.b3)))))

→ *[from term 60.30, $heap$_{790,1;810,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[64.22] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).b3)))))

→ *[const member of object with modified fields]*

[64.24] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{funcstart_790,1}$.b3)))))

→ *[const static or extern object]*

[64.25] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>($heap$_{init}$.b3)))))

→ *[expand definition of constant 'b3' at prang.cpp (45,24)]*

[64.26] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **asType**<**short int**>((170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) − (div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot * **asType**<**int**>(**asType**<**short int**>((**int**)63))))))

→ *[simplify]*

[64.32] $heap$_{790,1;812,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))

[Take given term]

[65.0] −**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))))***.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3 → (-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))]*

[65.1] −**asType<integer const>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[const member of object with modified fields]*

[65.4] −**asType<integer const>**($heap$_{funcstart_790,1}$.M3) < **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[const static or extern object]*

[65.5] −**asType**<**integer const**>($heap$_{init}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[65.6] −**asType**<**integer const**>(**asType**<**short int**>((**int**)30323)) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[simplify]*

[65.10] -30323 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[65.11] -30323 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p3)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[65.12] -30323 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[65.13] -30323 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[65.14] -30323 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)

→ *[simplify]*

[65.18] -30323 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))

[Take given term]

[66.0] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[66.1] !(0 == **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p3))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[66.2] !(0 == **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3))

→ *[evaluate dereferenced pointer into modified heap]*

[66.3] !(0 == **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[66.4] !(0 == **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3))

→ *[simplify]*

[66.8] !(0 == ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))

[Take given term]

[67.0] **asType<integer>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[67.1] **asType<integer>(operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[67.2] **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3) < **asType<integer>**($heap$_{790,1;812,8}$.M3)

→ *[evaluate dereferenced pointer into modified heap]*

[67.3] **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[67.4] **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).._**replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[simplify]*

[67.8] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) <
asType<**integer**>($heap$_{790,1;812,8}$.M3)

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[67.9] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType<integer>**($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M3)

→ *[const member of object with modified fields]*

[67.12] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType<integer>**($heap$_{funcstart_790,1}$.M3)

→ *[const static or extern object]*

[67.13] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>($heap$_{init}$.M3)

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[67.14] ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) < **asType**<**integer**>(**asType**<**short int**>((**int**)30323))

→ *[simplify]*

[67.24] -30323 < ((-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))

[Take given term]

[68.0] $heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[68.2] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) +

asType<int>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[68.3] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[evaluate dereferenced pointer into modified heap]*

[68.4] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[68.5] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.7] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) +

asType<int>(operator*(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to*
$heap$_{funcstart_790,1}$.*_**replace(this.***$r → **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).*_**replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))*_**replace(this.***$r →
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).*_**replace(***p1 → ((-2 * div(***heapIs***
$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs***
*$heap$_{funcstart_790,1}$).p1, 177).rem)))*_**replace(***p2 → ((-35 * div(***heapIs***
$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs***
$heap$_{funcstart_790,1}$).p2, 176).rem))))*_**replace(this.***$r →
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).*_**replace(***p1 → ((-2 * div(***heapIs***
$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs***
*$heap$_{funcstart_790,1}$).p1, 177).rem)))*_**replace(***p2 → ((-35 * div(***heapIs***
$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs***
*$heap$_{funcstart_790,1}$).p2, 176).rem)))*_**replace(***p3 → (-63 * div(***heapIs***
$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs***
$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[68.8] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace(this.**$r →
this.$r**.value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))**._replace(this.**$r →
this.$r**.value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))**._replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))**._replace(this.**$r →
this.$r**.value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))**._replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))**._replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**

$heap$_{funcstart_790,1}$).p3, 178)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short**
int>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))), **this**).p1) < (**int**)0)) *
asType<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs**
$heap$_{790,1;812,8}$, **this**).p1))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[68.9] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) < (**int**)0)) * **asType<int>**($heap$_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[evaluate dereferenced pointer into modified heap]*

[68.10] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType<short int>**((**asType<int>**(**static_cast<integer>**(**asType<int>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), []:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))))).p1) < (**int**)0)) *
asType<int>($\$heap_{790,1;812,8}$.M1)) + **asType<int>**(**operator***(**heapIs**
$\$heap_{790,1;812,8}$, **this**).p1))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[68.11] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.25] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[68.26] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [!(0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.31] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 1, [-1 < ((171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

→ *[from term 58.8, -1 < ((-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem)) is true if and only if 0 < ((-2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem))]*

[68.32] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.33] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

→ *[from term 64.32, $\$heap_{790,1;812,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))]*

[68.34] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((([0
< ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) *
asType<**int**>($heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[const member of object with modified fields]*

[68.37] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{funcstart_790,1}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[const static or extern object]*

[68.38] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>($heap$_{init}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[68.39] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30269))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.42] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → **asType**<**short int**>((([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 1, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) * 30269) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[move guard outside expression]*

[68.43] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 1 * 30269, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: 0 * 30269) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

→ *[simplify]*

[68.45] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

→ *[from term 64.32, $heap$_{790,1;812,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

$heap$_{funcstart_790,1}$).p3, 178).rem)))]

[68.46] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))), **this**).p1))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[68.47] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1))))

→ *[evaluate dereferenced pointer into modified heap]*

[68.48] $\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[68.49] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0) + **asType**<**int**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1))))

→ *[simplify]*

[68.56] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269, [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0))))

→ *[move guard outside expression]*

[68.57] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → **asType**<**short int**>(([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: 0 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))

→ *[simplify]*

[68.59] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

→ *[move guard outside expression]*

[68.62] ([0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))]: $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))), [0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))]: $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))))

[Take given term]

[69.0] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[69.2] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[simplify]*

[69.7] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, []: 0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[69.8] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)]: 0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[simplify]*

[69.12] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[const static or extern object]*

[69.13] $\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2]: 0) * **asType**<**int**>($\$heap_{init}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[69.14] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30307))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

→ *[simplify]*

[69.17] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) * 30307) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

→ *[move guard outside expression]*

[69.18] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 1 * 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0 * 30307) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

→ *[simplify]*

[69.20] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[69.21] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))))

→ *[simplify]*

[69.22] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 0) + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))

→ *[move guard outside expression]*

[69.23] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs**

$heap$_{790,1;815,8}$).p2]: 0 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))))

→ *[simplify]*

[69.25] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))

→ *[move guard outside expression]*

[69.28] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]: $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))

[Take given term]

[72.0] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[72.2] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[simplify]*

[72.7] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, []: 0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[72.8] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [!(0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)]: 0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[simplify]*

[72.12] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[const static or extern object]*

[72.13] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>($heap$_{init}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[72.14] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * **asType**<**int**>(**asType**<**short int**>((**int**)30323))) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[simplify]*

[72.17] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>((([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[move guard outside expression]*

[72.18] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 1 * 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 * 30323) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[simplify]*

[72.20] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[72.21] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 <

this.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **asType**<**int**>(**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))))

→ *[simplify]*

[72.22] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0) + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))

→ *[move guard outside expression]*

[72.23] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **asType**<**short int**>(([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 0 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))))

→ *[simplify]*

[72.25] $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3, [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))

→ *[move guard outside expression]*

[72.28] ([0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))), [-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3]: $heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))

[Branch on disjunction or conditional in term 72.28]

[75.0] ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Branch on disjunction or conditional in term 72.28]

[76.0] (0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Copy term 1.62]

[77.0] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 75.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[77.1] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.2] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.3] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[77.6] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 <

$-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) $\vee$ ...

$\rightarrow$ *[from term 75.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.*_**replace***(***this***.$r* $\rightarrow$ ***this***.$r***value***(***heapIs* *$heap$_{790,1;816,8}$).*_**replace***(p3 $\rightarrow$ 30323 +* ***this***.$r***value***(***heapIs* *$heap$_{790,1;816,8}$).p3))]*

[77.7] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$._**replace**(p3 $\rightarrow$ (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))).p2) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) $\vee$ ...

$\rightarrow$ *[evaluate dereferenced pointer into modified heap]*

[77.8] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$._**replace**(p3 $\rightarrow$ 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) $\vee$ ...

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.9] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$._**replace**(p3 $\rightarrow$ 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) $\vee$ ...

$\rightarrow$ *[simplify]*

[77.12] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) $\vee$ ...

$\rightarrow$ *[from term 75.0, $heap$_{funcend_790,1}$ is equal to*

*$heap*$_{790,1;816,8}$.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;816,8}$).**_replace**(*p3 → 30323 +* **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;816,8}$).*p3))]*

[77.13] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.14] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.15] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[77.22] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 75.0, $heap*$_{funcend_790,1}$ *is equal to* *$heap*$_{790,1;816,8}$.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;816,8}$).**_replace**(*p3 → 30323 +* **this**.*$r*.**value**(**heapIs** *$heap*$_{790,1;816,8}$).*p3))]*

[77.23] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs**

$\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.24] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.25] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[77.28] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 75.0, $\$heap_{funcend_790,1}$ is equal to $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3))]*

[77.29] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.30] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.31] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[77.34] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 75.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[77.35] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → (30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.36] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.37] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 → 30323 + **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3)) ∨ ...

→ *[simplify]*

[77.42] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 76.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{790,1;816,8}$).p3 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[77.42.0] -2 < (-1 + 0)

→ *[simplify]*

[77.42.2] **true**

[77.43] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ **false**) ∨ ...

→ *[simplify]*

[77.44] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

[Branch on disjunction or conditional in term 69.28]

[78.0] ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Branch on disjunction or conditional in term 69.28]

[79.0] (0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)

[Copy term 77.44]

[86.0] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ($\$heap_{funcend_790,1}$ == $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ ($\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)

→ *[from term 78.0, $\$heap_{790,1;816,8}$ is equal to $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))]*

[86.1] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.2] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.3] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[86.6] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨

(30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2 → 30307 +* **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[86.7] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.8] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.9] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[86.16] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2 → 30307 +* **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[86.17] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.18] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.19] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[86.22] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[86.23] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.24] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.25] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[86.30] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 79.0, literala <* **this**.*$r*.**value**(**heapIs** *$\$heap_{790,1;815,8}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[86.30.0] -2 < (-1 + 0)

→ *[simplify]*

[86.30.2] **true**

[86.31] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $\$heap_{790,1;816,8}$ is equal to $\$heap_{790,1;815,8}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$\$heap_{790,1;815,8}$).*_**replace**(*p2 → 30307 +* **this**.*$r*.**value**(**heapIs** *$\$heap_{790,1;815,8}$).p2))]*

[86.32] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2)))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.33] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.34] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]:

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)) ∨ ...

→ *[simplify]*

[86.38] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

[Branch on disjunction or conditional in term 68.62]

[87.0] ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Branch on disjunction or conditional in term 68.62]

[88.0] (0 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

[Copy term 78.0]

[89.0] ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

*$heap$_{funcstart_790,1}$).p2, 176).rem)))).*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p3, 178).rem))))).*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
*$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1 → 30269 + (-2 * div(***heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))]

[89.3] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).*_**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → (30269 + (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[89.4] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → (30307 +
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[89.5] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2)))) ∨ ...

→ *[simplify]*

[89.7] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 →
((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 →
(30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
(30307 + **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2)))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[89.8] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p2)))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[89.9] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r

→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p2)))) ∨ ...

→ *[simplify]*

[89.15] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))) ∨ ...

[Copy term 79.0]

[91.0] (0 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[91.1] (0 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[91.2] (0 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3,

178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[91.3] (0 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[simplify]*

[91.11] (0 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ ...

[Copy term 86.38]

[93.0] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))))*.**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → 30269 + (-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[93.1] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[93.2] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[93.3] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[93.14] ((30268 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 57.16, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[93.14.0] -2 < (-30269 + 30268)

→ *[simplify]*

[93.14.2] **true**

[93.15] (**false** ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*

*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace**(*p1 → 30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[93.16] (**false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 <

$-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) $\vee$ ...

$\rightarrow$ *[evaluate dereferenced pointer into modified heap]*

[93.17] (**false** $\vee$ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 $\rightarrow$ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 $\rightarrow$ ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 $\rightarrow$ ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 $\rightarrow$ 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 $\rightarrow$ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 $\rightarrow$ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 $\rightarrow$ ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 $\rightarrow$ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 $\rightarrow$ ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 $\rightarrow$ (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) $\vee$ (30306 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30322 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) $\vee$ ...

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[93.18] (**false** $\vee$ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 $\rightarrow$ ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[93.23] (**false** ∨ (-1 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 88.0, literala < ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[93.23.0] -2 < (-1 + 0)

→ *[simplify]*

[93.23.2] **true**

[93.24] (**false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[93.25] (**false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[93.26] (**false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[93.27] (**false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[93.35] (**false** ∨ **false** ∨ (30306 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 61.17, literala < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[93.35.0] -2 < (-30307 + 30306)

→ *[simplify]*

[93.35.2] **true**

[93.36] (**false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))))).***_replace***(***this**.*$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → 30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]

[93.37] (**false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[93.38] (**false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[93.39] (**false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[simplify]*

[93.46] (**false** ∨ **false** ∨ **false** ∨ (30322 < ((63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 65.18, literala < ((-170 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178).rem) + (63 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p3, 178).quot)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[93.46.0] -2 < (-30323 + 30322)

→ *[simplify]*

[93.46.2] **true**

[93.47] (**false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[93.48] **false** ∨ ...

[Remove 'false' term 93.48 and fetch new term from containing clause]

[94.0] ($\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Remove 'false' term 93.48 and fetch new term from containing clause]

[95.0] (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Copy term 77.44]

[86.38] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[from term 94.0, $heap$_{790,1;815,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*) + (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*) + (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*rem*)))).*_**replace**(*p1* → (-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*)))*]*

[86.39] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.40] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.41] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[86.47] ((-1 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 95.0, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[86.47.0] -2 < (-1 + 0)

→ *[simplify]*

[86.47.2] **true**

[86.48] (**false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 94.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(**this**.*$r →* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(**this**.*$r →* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[86.49] (**false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.50] (**false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.51] (**false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[86.54] (**false** ∨ (30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 59.22, literala < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[86.54.0] -2 < (-30269 + 30268)

→ *[simplify]*

[86.54.2] **true**

[86.55] (**false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 94.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))))._**replace***(***this***.$r →* **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$)._**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem)))._**replace***(p1 → (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[86.56] (**false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.57] (**false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.58] (**false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[86.66] (**false** ∨ **false** ∨ (30306 < ((35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 61.17, literala < ((-172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[86.66.0] -2 < (-30307 + 30306)

→ *[simplify]*

[86.66.2] **true**

[86.67] (**false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 94.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*

*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[86.68] (**false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[86.69] (**false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[86.70] (**false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[simplify]*

[86.77] (**false** ∨ **false** ∨ **false** ∨ (30322 < ((63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 65.18, literala < ((-170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[86.77.0] -2 < (-30323 + 30322)

→ *[simplify]*

[86.77.2] **true**

[86.78] (**false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[86.79] **false** ∨ ...

[Remove 'false' term 86.79 and fetch new term from containing clause]

[98.0] ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Copy term 1.62]

[77.44] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 98.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[77.45] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.46] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.47] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[77.50] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 <

$-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30322 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) $\vee$ ...

$\rightarrow$ *[from term 98.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* $\rightarrow$ ***this***.$r***value***(***heapIs*** *$heap$_{790,1;815,8}$)*._**replace***(p2* $\rightarrow$ ***this***.$r***value***(***heapIs*** *$heap$_{790,1;815,8}$)*.p2))]*

[77.51] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p2) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30322 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) $\vee$ ...

$\rightarrow$ *[evaluate dereferenced pointer into modified heap]*

[77.52] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (-1 $<$ $-$([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30322 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) $\vee$ ...

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.53] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (-1 $<$ $-$([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30322 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) $\vee$ ...

$\rightarrow$ *[simplify]*

[77.56] ((-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (30322 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) $\vee$ ...

[Remove 'false' term 86.79 and fetch new term from containing clause]

[99.0] (-1 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)._**replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) $\vee$ (-1 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Copy term 98.0]

[101.0] ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) $\vee$ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs**

$heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

$heap*$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace***(***this***.$r →*
this.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).*_**replace***(p1 → ((-2 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p1, 177).quot)*
*+ (171 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p2, 176).quot)*
*+ (172 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p2, 176).rem))))).*_**replace***(***this***.*$r →*
this.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).*_**replace***(p1 → ((-2 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p1, 177).quot)*
*+ (171 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p2, 176).quot)*
*+ (172 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p3, 178).quot)*
*+ (170 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p3, 178).rem))))).*_**replace***(***this***.*$r →*
this.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).*_**replace***(p1 → ((-2 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p1, 177).quot)*
*+ (171 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p2, 176).quot)*
*+ (172 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p3, 178).quot)*
*+ (170 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → 30269 + (-2 * div(***heapIs***
$heap*$_{funcstart_790,1}$,* ***this***.*$r*.***value***(***heapIs*** *$heap*$_{funcstart_790,1}$*).p1, 177).quot)*
*+ (171 * div(***heapIs*** *$heap*$_{funcstart_790,1}$*,* ***this***.*$r*.***value***(***heapIs***
$heap*$_{funcstart_790,1}$).p1, 177).rem)))]*

[101.2] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[101.3] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[101.4] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ ...

→ *[simplify]*

[101.6] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ ...

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))))*.**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → 30269 + (-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[101.7] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[101.8] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p2))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[101.9] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2))) ∨ ...

→ *[simplify]*

[101.14] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 →
((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 →
(30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))) ∨ ...

[Copy term 99.0]

[102.0] (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*,
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 *
div(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1*, 177).*rem*)))).*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*)
+ (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*)
+ (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p2*, 176).*rem*)))).*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*)
+ (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*)
+ (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*)
+ (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p3*, 178).*rem*)))).*_**replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*)
+ (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*)
+ (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*)
+ (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p3*, 178).*rem*))).*_**replace**(*p1* → 30269 + (-2 * *div*(**heapIs**
$heap$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*)
+ (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**
$heap$_{funcstart_790,1}$).*p1*, 177).*rem*)))*]*

[102.1] (-1 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.*_**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[102.2] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[102.3] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[simplify]*

[102.8] (-1 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ ...

→ *[from term 62.8, -1 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) is true if and only if 0 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))]*

[102.9] (0 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ ...

[Copy term 77.44]

[105.0] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 101.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)* + *(170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem))))*.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)* + *(171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)* + *(172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)* + *(170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)* + *(171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))))*.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)* + *(171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)* + *(172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)* + *(170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)* + *(171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))))*.**_replace**(*p2 → (-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)* + *(172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))]*

[105.1] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[105.2] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[105.3] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[105.15] ((30268 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 57.16, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[105.15.0] -2 < (-30269 + 30268)

→ *[simplify]*

[105.15.2] **true**

[105.16] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 101.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 *
div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 →
((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 →
(30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
(-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$,

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$*).p2, 176).rem)))]*

[105.17] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[105.18] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[105.19] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[105.25] (**false** ∨ (-1 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 102.9, literala < ((-172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[105.25.0] -2 < (-1 + 0)

→ *[simplify]*

[105.25.2] **true**

[105.26] (**false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 101.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]

[105.27] (**false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[105.28] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs**
$\$heap_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3))
∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[105.29] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[105.35] (**false** ∨ **false** ∨ (-1 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 88.0, literala < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[105.35.0] -2 < (-1 + 0)

→ *[simplify]*

[105.35.2] **true**

[105.36] (**false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 101.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)*

*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[105.37] (**false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[105.38] (**false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[105.39] (**false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[105.42] (**false** ∨ **false** ∨ **false** ∨ (30306 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 63.23, literala < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[105.42.0] -2 < (-30307 + 30306)

→ *[simplify]*

[105.42.2] **true**

[105.43] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 101.14, $\$heap_{790,1;816,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3* → *((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1* → *(30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3* → *((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1* → *(30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *(-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[105.44] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[105.45] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[105.46] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p3)) ∨ ...

→ *[simplify]*

[105.54] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 65.18, literala < ((-170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* ***this****.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* ***this****.$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[105.54.0] -2 < (-30323 + 30322)

→ *[simplify]*

[105.54.2] **true**

[105.55] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[105.56] **false** ∨ ...

[Remove 'false' term 105.56 and fetch new term from containing clause]

[106.0] ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Remove 'false' term 105.56 and fetch new term from containing clause]

[107.0] (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Copy term 1.62]

[77.56] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 99.0, -1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is true if and only if 0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]*

[77.57] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 98.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r***.value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2* → **this***.$r***.value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[77.58] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.59] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.60] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[77.63] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 98.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r***.value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2* → **this***.$r***.value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[77.64] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.65] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 ==

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.66] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[77.69] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 98.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[77.70] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.71] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.72] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)) ∨ ...

→ *[simplify]*

[77.75] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 106.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, *178*).*quot*) + (*170* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, *178*).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, *176*).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, *178*).*quot*) + (*170* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, *178*).*rem*))).*_**replace**(*p1* → (-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, *177*).*rem*)))*]*

[77.76] ((0 == **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.77] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.78] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[77.83] ((0 == ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 62.8, 0 == ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) is false]*

[77.84] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 106.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (171 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (172 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (171 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (172 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*))).**_replace**(*p3* → ((-63 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*quot*) + (170 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (171 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (172 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*))).**_replace**(*p3* → ((-63 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*quot*) + (170 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*rem*))).**_replace**(*p1* → (-2 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (171 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*)))]

[77.85] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.86] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.87] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[77.93] (**false** ∨ (-1 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 107.0, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[77.93.0] -2 < (-1 + 0)

→ *[simplify]*

[77.93.2] **true**

[77.94] (**false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 106.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))))).***_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))).***_replace**(*p1 → (-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[77.95] (**false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.96] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.97] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[77.100] (**false** ∨ **false** ∨ (30268 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 59.22, literala < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[77.100.0] -2 < (-30269 + 30268)

→ *[simplify]*

[77.100.2] **true**

[77.101] (**false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 106.0, $\$heap_{790,1;815,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem))).***_replace**(*p1 → (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]

[77.102] (**false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.103] (**false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.104] (**false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[77.109] (**false** ∨ **false** ∨ **false** ∨ (30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 63.23, literala < ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*quot*) + (*172 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*rem*)) *is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[77.109.0] -2 < (-30307 + 30306)

→ *[simplify]*

[77.109.2] **true**

[77.110] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 106.0, $heap$_{790,1;815,8}$ is equal to* *$heap$_{funcstart_790,1}$*.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*quot*) + (*171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*quot*) + (*171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*quot*) + (*172 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*quot*) + (*171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*quot*) + (*172 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*rem*))).**_replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3, 178*).*quot*) + (*170 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3, 178*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*quot*) + (*171 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*rem*))).**_replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*quot*) + (*172 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2, 176*).*rem*))).**_replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3, 178*).*quot*) + (*170 * div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3, 178*).*rem*))).**_replace**(*p1* → (-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1, 177*).*quot*)

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[77.111] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[77.112] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[77.113] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[simplify]*

[77.120] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (-170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 65.18, literala < ((-170 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(heapIs**
$heap$_{funcstart_790,1}$, ***this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot))*
is false whenever -2 < (-30323 + literala)]

Proof of rule precondition:

[77.120.0] -2 < (-30323 + 30322)

→ *[simplify]*

[77.120.2] **true**

[77.121] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[77.122] **false** ∨ ...

[Remove 'false' term 77.122 and fetch new term from containing clause]

[109.0] $\$heap_{funcend_790,1}$ == $\$heap_{790,1;816,8}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))

[Take goal term]

[1.62] (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.63] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.64] (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.65] (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[simplify]*

[1.68] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 <

this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.69] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.70] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.71] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[simplify]*

[1.74] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.75] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs**

$\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3))).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.76] (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$)).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.77] (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$)).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)

→ *[simplify]*

[1.80] (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)

[Remove 'false' term 77.122 and fetch new term from containing clause]

[110.0] -1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3

[Take goal term]

[1.80] (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)

→ *[from term 110.0, -1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3 is true if and only if 0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3]*

[1.81] (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1)

$\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

$\rightarrow$ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.82] (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (0 $==$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

$\rightarrow$ *[evaluate dereferenced pointer into modified heap]*

[1.83] (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (0 $==$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) $\vee$ (30268 $<$ ([**this**.$r $==$ **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.84] (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (0 $==$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) $\vee$ (30268 $<$ ([**this**.$r $==$ **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r $==$ **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

$\rightarrow$ *[simplify]*

[1.87] (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (0 $==$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (30306 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) $\vee$ (30322 $<$ **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

$\rightarrow$ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.88] (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$ (-1 $<$ $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) $\vee$ (0 $==$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) $\vee$ (30268 $<$ **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) $\vee$

(30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.89] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.90] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[simplify]*

[1.93] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[from term 109.0, $heap$_{funcend_790,1}$ is equal to $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))]*

[1.94] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.95] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < ([**this**.$r ==

this.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.96] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$)).p3)

→ *[simplify]*

[1.99] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

[Copy term 109.0]

[112.0] ($heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 89.15, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace***(***this***.$r → **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → 30307 + (-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.**value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[112.2] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[112.3] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[112.4] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ ...

→ *[simplify]*

[112.6] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3))) ∨ ...

→ *[from term 89.15, $heap$_{790,1;816,8}$ is equal to*

$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → 30307 + (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[112.7] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[112.8] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 →

((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p3))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[112.9] ($\$heap_{funcend_790,1}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3))) ∨ ...

→ *[simplify]*

[112.14] ($heap$_{funcend_790,1}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 →

(30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))) ∨ ...

[Copy term 110.0]

[113.0] (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 89.15, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → 30307 + (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[113.1] (-1 < **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p3) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[113.2] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[113.3] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p3) ∨ ...

→ *[simplify]*

[113.8] (-1 < ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))) ∨ ...

→ *[from term 66.8, -1 < ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)) is true if and only if 0 < ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))]*

[113.9] (0 < ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))) ∨ ...

[Copy term 1.62]

[114.0] ((-1 < −**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ($\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ ($\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs***

$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(p3 → (-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$,

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$*).p3, 178).rem)))]*

[114.1] ((-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.2] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →

((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.3] ((-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 <

this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[114.16] ((30268 < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1,
177).quot))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 57.16, literala < ((-171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot))
is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[114.16.0] -2 < (-30269 + 30268)

→ *[simplify]*

[114.16.2] **true**

[114.17] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (-1 <
−**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (30307 + (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[114.18] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.19] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.20] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[114.32] (**false** ∨ (30306 < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 61.17, literala < ((-172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[114.32.0] -2 < (-30307 + 30306)

→ *[simplify]*

[114.32.2] **true**

[114.33] (**false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs***

$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (30307 + (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[114.34] (**false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.35] (**false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.36] (**false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r ==

this.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[114.42] (**false** ∨ **false** ∨ (-1 < ((63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (-170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 113.9, literala < ((-170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem) + (63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[114.42.0] -2 < (-1 + 0)

→ *[simplify]*

[114.42.2] **true**

[114.43] (**false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to $heap$_{funcstart_790,1}$.***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs***

$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (30307 + (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[114.44] (**false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.45] (**false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.46] (**false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 →
((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 →
(30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →

30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[114.53] (**false** ∨ **false** ∨ **false** ∨ (-1 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 88.0, literala < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[114.53.0] -2 < (-1 + 0)

→ *[simplify]*

[114.53.2] **true**

[114.54] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs**]*

$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → (-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))]*

[114.55] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →

((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.56] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.57] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[simplify]*

[114.63] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (-1 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 91.11, literala < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[114.63.0] -2 < (-1 + 0)

→ *[simplify]*

[114.63.2] **true**

[114.64] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) ∨ ...

→ *[from term 112.14, $heap$_{funcend_790,1}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs***

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)* + *(170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))))*.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → (30307 + (-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))))*.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → (30307 + (-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → (-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))]

[114.65] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[114.66] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[114.67] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → 30307 + (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p3)) ∨ ...

→ *[simplify]*

[114.70] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 67.24, literala < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[114.70.0] -2 < (-30323 + 30322)

→ *[simplify]*

[114.70.2] **true**

[114.71] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[114.72] **false** ∨ ...

[Remove 'false' term 114.72 and fetch new term from containing clause]

[115.0] ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Remove 'false' term 114.72 and fetch new term from containing clause]

[116.0] (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

[Copy term 1.99]

[117.0] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ($heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[117.1] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.2] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.3] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[117.6] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2 → 30307 +* **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[117.7] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).*_**replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.8] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).*_**replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.9] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).*_**replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[117.12] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2 → 30307 +* **this***.$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[117.13] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.14] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.15] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[117.22] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[117.23] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.24] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.25] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[117.28] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[117.29] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.30] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.31] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[117.36] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 79.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).p2 is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[117.36.0] -2 < (-1 + 0)

→ *[simplify]*

[117.36.2] **true**

[117.37] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 78.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.*_**replace***(***this***.$r* → **this***.$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).*_**replace***(p2 → 30307 +* **this***.$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[117.38] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → (30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2)))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.39] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 → 30307 +

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.40] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → 30307 + **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)) ∨ ...

→ *[simplify]*

[117.44] ((0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 115.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)*

*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace**(*p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[117.45] ((0 == **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 <

this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.46] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.47] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[117.51] ((0 == ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 66.8, 0 == ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)) is false]*

[117.52] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 115.0, $heap*$_{790,1;815,8}$ *is equal to $heap*$_{funcstart_790,1}$.**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).**_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).**_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem))).**_replace**(*p1 → (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[117.53] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.54] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2,

176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.55] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[117.61] (**false** ∨ (-1 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 116.0, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[117.61.0] -2 < (-1 + 0)

→ *[simplify]*

[117.61.2] **true**

[117.62] (**false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 115.0, $heap$_{790,1;815,8}$ is equal to*
$heap$_{funcstart_790,1}$.*_**replace(this.***$r → **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).*_**replace(***p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace(this.***$r →
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).*_**replace(***p1* → *((-2 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace(***p2* → *((-35 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).*_**replace(this.***$r →
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).*_**replace(***p1* → *((-2 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace(***p2* → *((-35 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace(***p3* → *((-63 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))))).*_**replace(this.***$r →
this.*$r***.value(heapIs** *$heap$_{funcstart_790,1}$).*_**replace(***p1* → *((-2 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace(***p2* → *((-35 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace(***p3* → *((-63 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
*$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace(***p1* → *(-2 * div(***heapIs**
*$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this.***$r***.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))]

[117.63] (**false** ∨ **false** ∨ (30268 < **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$.**_replace(this.**$r → **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).**_replace(**p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r**.value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace(this.**$r →
this.$r**.value(heapIs** $heap$_{funcstart_790,1}$).**_replace(**p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this.**$r**.value(heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨
...

→ *[evaluate dereferenced pointer into modified heap]*

[117.64] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨
...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.65] (**false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[117.68] (**false** ∨ **false** ∨ (30268 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 59.22, literala < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[117.68.0] -2 < (-30269 + 30268)

→ *[simplify]*

[117.68.2] **true**

[117.69] (**false** ∨ **false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 115.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace***(***this***.$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace***(***this***.$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace***(***this***.$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[117.70] (**false** ∨ **false** ∨ **false** ∨ (30306 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.71] (**false** ∨ **false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.72] (**false** ∨ **false** ∨ **false** ∨ (30306 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[simplify]*

[117.80] (**false** ∨ **false** ∨ **false** ∨ (30306 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 61.17, literala < ((-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[117.80.0] -2 < (-30307 + 30306)

→ *[simplify]*

[117.80.2] **true**

[117.81] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)) ∨ ...

→ *[from term 115.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))))*.**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[117.82] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[117.83] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[117.84] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)) ∨ ...

→ *[simplify]*

[117.88] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 67.24, literala < ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[117.88.0] -2 < (-30323 + 30322)

→ *[simplify]*

[117.88.2] **true**

[117.89] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[117.90] **false** ∨ ...

[Remove 'false' term 117.90 and fetch new term from containing clause]

[120.0] $heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))

[Take goal term]

[1.99] (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 120.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.***_replace***(***this***.$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).***_replace***(p2* → **this**.*$r*.**value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[1.100] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.101] (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.102] (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**

$heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.105] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 120.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[1.106] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.107] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.108] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.111] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs**

$\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)

→ *[from term 120.0, $\$heap_{790,1;816,8}$ is equal to $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))]*

[1.112] (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.113] (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.114] (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)

→ *[simplify]*

[1.117] (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)

[Remove 'false' term 117.90 and fetch new term from containing clause]

[121.0] -1 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2

[Copy term 120.0]

[123.0] ($\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ ($\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).rem)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace(***this**.*$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace(***this**.*$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace(***p1 → 30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[123.2] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace(**p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace(**p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace(**p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace(this**.$r → **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).**_replace(**p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace(**p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value(heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[123.3] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[123.4] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r
→ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2))) ∨ ...

→ *[simplify]*

[123.6] ($\$heap_{790,1;816,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))) ∨ ...

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot) + (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot) + (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).rem))).***_replace**(*p1 → 30269 + (-2 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot) + (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]

[123.7] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2))) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[123.8] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →

((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2))) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[123.9] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2))) ∨ ...

→ *[simplify]*

[123.14] ($heap$_{790,1;816,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))) ∨ ...

[Copy term 121.0]

[124.0] (-1 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ ($heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 87.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →*

this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-2 * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-*35* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-*2* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-*35* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*))).**_replace**(*p3* → ((-*63* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*quot*) + (*170* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*rem*)))).**_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1* → ((-*2* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*))).**_replace**(*p2* → ((-*35* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*quot*) + (*172* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2*, *176*).*rem*))).**_replace**(*p3* → ((-*63* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*quot*) + (*170* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3*, *178*).*rem*))).**_replace**(*p1* → *30269* + (-*2* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*quot*) + (*171* * *div*(**heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1*, *177*).*rem*)))]

[124.1] (-1 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[124.2] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[124.3] (-1 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ ...

→ *[simplify]*

[124.8] (-1 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))) ∨ ...

→ *[from term 62.8, -1 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)) is true if and only if 0 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))]*

[124.9] (0 < ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))) ∨ ...

[Copy term 1.99]

[126.0] ((0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ($\$heap_{790,1;815,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))) ∨ (0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))

→ *[from term 123.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)*

*+ (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace**(*p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.1] ((0 == **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[126.2] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.3] ((0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[126.8] ((0 == ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 66.8, 0 == ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)) is false]*

[126.9] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 123.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)*

*+ (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))))).***_replace(***this**.*$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace(***p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))))).***_replace(***this**.*$r →* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace(***p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.10] (**false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨

(30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[126.11] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).._**replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).._**replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.12] (**false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[126.24] (**false** ∨ (30268 < ((-171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 57.16, literala < ((-171 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$\$heap_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$\$heap_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[126.24.0] -2 < (-30269 + 30268)

→ *[simplify]*

[126.24.2] **true**

[126.25] (**false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs**

$heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 123.14, $heap$_{790,1;816,8}$ is equal to*
*$heap$_{funcstart_790,1}$.*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*) + (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*quot*) + (170 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p3*, 178).*rem*))).*_**replace**(*p1* → (30269 + (-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*_**replace**(*p1* → ((-2 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*quot*) + (171 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p1*, 177).*rem*))).*_**replace**(*p2* → ((-35 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*quot*) + (172 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$*).*p2*, 176).*rem*))).*_**replace**(*p3* → ((-63 * *div*(**heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.26] (**false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 *

div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨
...

→ *[evaluate dereferenced pointer into modified heap]*

[126.27] (**false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.28] (**false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[126.34] (**false** ∨ **false** ∨ (-1 < ((35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (-172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 124.9, literala < ((-172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem) + (35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[126.34.0] -2 < (-1 + 0)

→ *[simplify]*

[126.34.2] **true**

[126.35] (**false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 123.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace(***p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace(***p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace(***p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace***(***this***.$r* → **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → (-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.36] (**false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[126.37] (**false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)), []:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs**
$\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨
...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.38] (**false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[126.44] (**false** ∨ **false** ∨ **false** ∨ (-1 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 88.0, literala < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[126.44.0] -2 < (-1 + 0)

→ *[simplify]*

[126.44.2] **true**

[126.45] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 123.14, $\$heap_{790,1;816,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3* → *((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1* → *(30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3* → *((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1* → *(30269 + (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *(-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.46] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).*_**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).*_**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[126.47] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 →
(-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs**

$heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.48] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**

$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[simplify]*

[126.51] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 63.23, literala < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[126.51.0] -2 < (-30307 + 30306)

→ *[simplify]*

[126.51.2] **true**

[126.52] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)) ∨ ...

→ *[from term 123.14, $heap$_{790,1;816,8}$ is equal to $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs***

*$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))))).*_**replace***(***this***.$r →* **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace***(***this***.$r →* **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → ((-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace***(p3 → ((-63 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace***(p1 → (30269 + (-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace***(p2 → (-35 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p2, 176).rem)))]*

[126.53] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).rem))))).*_**replace***(***this***.$r →* **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs*** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs*** $heap$_{funcstart_790,1}$, **this**.$r.***value***(***heapIs***

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))))).p3)) ∨ ...

→ *[evaluate dereferenced pointer into modified heap]*

[126.54] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r ==

this.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3)) ∨ ...

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[126.55] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → (-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → 30269 + (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p3)) ∨ ...

→ *[simplify]*

[126.60] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))) ∨ ...

→ *[from term 67.24, literala < ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[126.60.0] -2 < (-30323 + 30322)

→ *[simplify]*

[126.60.2] **true**

[126.61] (**false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**) ∨ ...

→ *[simplify]*

[126.62] **false** ∨ ...

[Remove 'false' term 126.62 and fetch new term from containing clause]

[127.0] $heap$_{790,1;815,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))

[Remove 'false' term 126.62 and fetch new term from containing clause]

[128.0] 0 < ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))

[Take goal term]

[1.117] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 121.0, -1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2 is true if and only if 0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2]*

[1.118] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 120.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs***

*$heap$_{790,1;815,8}$).*_**replace***(p2 →* **this***.$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[1.119] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.120] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.121] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[simplify]*

[1.124] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[from term 120.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$.***_replace***(***this***.$r →* **this***.$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).***_replace***(p2 →* **this***.$r.***value***(***heapIs** *$heap$_{790,1;815,8}$).p2))]*

[1.125] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.126] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 <

$-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) $\vee$ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.127] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) $\vee$ (-1 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p2) $\vee$ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

$\rightarrow$ *[simplify]*

[1.130] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) $\vee$ (-1 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;816,8}$).p3)

$\rightarrow$ *[from term 120.0, $heap$_{790,1;816,8}$ is equal to $heap$_{790,1;815,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))]*

[1.131] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) $\vee$ (-1 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$._**replace**(**this**.$r $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2))).p3)

$\rightarrow$ *[evaluate dereferenced pointer into modified heap]*

[1.132] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) $\vee$ (-1 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) $\vee$ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)._**replace**(p2 $\rightarrow$ **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2), []: **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$)).p3)

$\rightarrow$ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.133] (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) $\vee$ (-1 < $-$**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) $\vee$ (0 == **this**.$r.**value**(**heapIs**

$\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).**_replace**(p2 → **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$)).p3)

→ *[simplify]*

[1.136] (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[from term 127.0, $\$heap_{790,1;815,8}$ is equal to $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.137] (0 == **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.138] (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))))).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.139] (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[simplify]*

[1.144] (0 == ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 62.8, 0 == ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 **

*div(***heapIs** *$heap$_{funcstart_790,1}$*, **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)) is false]*

[1.145] **false** ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 127.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.*__**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*__**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).*__**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*__**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*__**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))))).*__**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*__**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*__**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*__**replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))))).*__**replace***(***this***.$r* → **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*__**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*__**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*__**replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*__**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this***.$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.146] **false** ∨ (0 == **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.147] **false** ∨ (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2,

176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.148] **false** ∨ (0 == ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem))))).p3) ∨ (-1 < −**this**.$r.**value**(**heapIs**
$heap$_{790,1;815,8}$).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨
(30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 <
this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[simplify]*

[1.152] **false** ∨ (0 == ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3,
178).rem))) ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30268 <
this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs**
$heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 66.8, 0 == ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,*
***this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 *
div(***heapIs** *$heap$_{funcstart_790,1}$,* ***this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p3, 178).rem)) is false]*

[1.153] **false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨
(30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 <
this.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs**
$heap$_{790,1;815,8}$).p3)

→ *[from term 127.0, $heap$_{790,1;815,8}$ is equal to*
*$heap$_{funcstart_790,1}$.***_replace**(***this**.$r* → ***this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))))*._**replace***(***this***.$r →* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))*._**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))))*._**replace***(***this***.$r →* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))*._**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))*._**replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))))*._**replace***(***this***.$r →* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).*_**replace***(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))*._**replace***(p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))*._**replace***(p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))*._**replace***(p1 → (-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value***(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.154] **false** ∨ **false** ∨ (-1 < −**this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.155] **false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs**
$\$heap_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨
(30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.156] **false** ∨ **false** ∨ (-1 < −([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot)
+ (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]:
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot)

+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[simplify]*

[1.162] **false** ∨ **false** ∨ (-1 < ((2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (-171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))) ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 128.0, literala < ((-171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem) + (2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot)) is false whenever -2 < (0 + literala)]*

Proof of rule precondition:

[1.162.0] -2 < (-1 + 0)

→ *[simplify]*

[1.162.2] **true**

[1.163] **false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 127.0, $heap$_{790,1;815,8}$ is equal to $heap$_{funcstart_790,1}$.***_replace**(***this**.$r → **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).***_replace**(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace**(***this**.$r → **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).***_replace**(p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$, **this**.$r.**value**(***heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(p2 → ((-35 * div(***heapIs**

*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem))))*.**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem))))*.**_replace**(**this**.*$r* →
this.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).**_replace**(*p1 → ((-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))*.**_replace**(*p2 → ((-35 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p2, 176).quot)*
*+ (172 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p2, 176).rem)))*.**_replace**(*p3 → ((-63 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p3, 178).quot)*
*+ (170 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p3, 178).rem)))*.**_replace**(*p1 → (-2 * div(***heapIs**
*$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs** *$heap*$_{funcstart_790,1}$).*p1, 177).quot)*
*+ (171 * div(***heapIs** *$heap*$_{funcstart_790,1}$, **this**.*$r*.**value**(**heapIs**
*$heap*$_{funcstart_790,1}$).*p1, 177).rem)))]*

[1.164] **false** ∨ **false** ∨ **false** ∨ (30268 < **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$,
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 *
div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p2, 176).rem))))).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)
+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**
$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs**
$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot)
+ (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.165] **false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.166] **false** ∨ **false** ∨ **false** ∨ (30268 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs**

$\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).rem))))).p1) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[simplify]*

[1.169] **false** ∨ **false** ∨ **false** ∨ (30268 < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))) ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[from term 59.22, literala < ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)) is false whenever -2 < (-30269 + literala)]*

Proof of rule precondition:

[1.169.0] -2 < (-30269 + 30268)

→ *[simplify]*

[1.169.2] **true**

[1.170] **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $\$heap_{790,1;815,8}$).p3)

→ *[from term 127.0, $\$heap_{790,1;815,8}$ is equal to $\$heap_{funcstart_790,1}$.__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem)))).__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).__**replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem)))).__**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).__**replace**(p1 → ((-2 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p1, 177).rem))).__**replace**(p2 → ((-35 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p2, 176).rem))).__**replace**(p3 → ((-63 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $\$heap_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $\$heap_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

*$heap$_{funcstart_790,1}$).p3, 178).rem)))).*_**replace**(**this**.*$r* → **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).*_**replace**(*p1* → *((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).*_**replace**(*p2* → *((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).*_**replace**(*p3* → *((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).*_**replace**(*p1* → *(-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value**(**heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.171] **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))._**replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$)._**replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))._**replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))._**replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot)

+ (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.172] **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.173] **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p2) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[simplify]*

[1.178] **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30306 < ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))) ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 63.23, literala < ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)) is false whenever -2 < (-30307 + literala)]*

Proof of rule precondition:

[1.178.0] -2 < (-30307 + 30306)

→ *[simplify]*

[1.178.2] **true**

[1.179] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{790,1;815,8}$).p3)

→ *[from term 127.0, $heap$_{790,1;815,8}$ is equal to* *$heap$_{funcstart_790,1}$.***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)))).***_replace(this**.*$r* → **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).***_replace**(*p1 → ((-2 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p1, 177).rem))).***_replace**(*p2 → ((-35 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p2, 176).rem))).***_replace**(*p3 → ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r*.**value(heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem))).***_replace**(*p1 → (-2 * div(***heapIs**

*$heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))]*

[1.180] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).p3)

→ *[evaluate dereferenced pointer into modified heap]*

[1.181] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs**

$heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), []: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))))).p3)

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.182] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))).**_replace**(p1 → (-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot)

+ (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem)))).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).**_replace**(p1 → ((-2 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).quot) + (171 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p1, 177).rem))).**_replace**(p2 → ((-35 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).quot) + (172 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p2, 176).rem))).**_replace**(p3 → (-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem))))).p3)

→ *[simplify]*

[1.186] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ (30322 < ((-63 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(**heapIs** $heap$_{funcstart_790,1}$, **this**.$r.**value**(**heapIs** $heap$_{funcstart_790,1}$).p3, 178).rem)))

→ *[from term 67.24, literala < ((-63 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).quot) + (170 * div(***heapIs** *$heap$_{funcstart_790,1}$,* **this**.*$r.***value***(***heapIs** *$heap$_{funcstart_790,1}$).p3, 178).rem)) is false whenever -2 < (-30323 + literala)]*

Proof of rule precondition:

[1.186.0] -2 < (-30323 + 30322)

→ *[simplify]*

[1.186.2] **true**

[1.187] **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false** ∨ **false**

→ *[simplify]*

[1.188] **false**

Proof of verification condition: Precondition of 'operator /' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (91,34)

Condition defined at: built in declaration

To prove: !(0.0 == **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1)))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r →

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

$heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $\$heap_{funcend_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcend_790,1}$)

Proof:

[Take goal term]

[1.0] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1)))

→ *[const static or extern object]*

[1.1] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{init}$.M1)))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.2] !(0.0 == **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30269))))

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Precondition of 'operator /' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (92,34)

Condition defined at: built in declaration

To prove: !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2)))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p1))))

$\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

$\$heap_{funcend_790,1}$ == $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $\$heap_{funcend_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))

Proof:

[Take goal term]

[1.0] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2)))

→ *[const static or extern object]*

[1.1] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{init}$.M2)))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.2] !(0.0 == **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30307))))

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Precondition of 'operator /' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (93,34)

Condition defined at: built in declaration

To prove: !(0.0 == **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3)))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0

== **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs**

$\$heap_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

$\$heap_{funcend_790,1}$ == $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $\$heap_{funcend_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))

raux2 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p2)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2))

Proof:

[Take goal term]

[1.0] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M3)))

→ *[const static or extern object]*

[1.1] !(0.0 == **asType**<**double**>(**static_cast**<**real**>($\$heap_{init}$.M3)))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.2] !(0.0 == **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30323))))

→ *[simplify]*

[1.9] **true**

Proof of verification condition: Assertion valid

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (97,30)

To prove: **asType**<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$,

this).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short**

int>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

$heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))

raux2 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p2)) /

asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))

raux3 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p3)) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux1)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux2)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux3)

Proof:

[Take given term]

[81.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p1)) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))) == raux1

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[81.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))) == raux1

→ *[simplify]*

[81.3] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))) == raux1

→ *[const static or extern object]*

[81.4] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>($heap$_{init}$.M1))) == raux1

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[81.5] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30269)))) == raux1

→ *[simplify]*

[81.11] 0.0 == (−raux1 + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))

[Take given term]

[82.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p2)) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))) == raux2

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[82.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) /
asType<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))) == raux2

→ *[simplify]*

[82.3] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))) == raux2

→ *[const static or extern object]*

[82.4] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / **asType**<**double**>(**static_cast**<**real**>($heap$_{init}$.M2))) == raux2

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[82.5] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30307)))) == raux2

→ *[simplify]*

[82.11] 0.0 == (−raux2 + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0))

[Take given term]

[83.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[83.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[simplify]*

[83.3] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[const static or extern object]*

[83.4] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>($heap$_{init}$.M3))) == raux3

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[83.5] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30323)))) == raux3

→ *[simplify]*

[83.11] 0.0 == (−raux3 + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0))

[Take goal term]

[1.0] **asType**<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[simplify]*

[1.2] 0.0 < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[from term 82.11, raux2 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p2) / 30307.0]*

[1.3] 0.0 < ((**asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[simplify]*

[1.4] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[from term 81.11, raux1 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p1) / 30269.0]*

[1.5] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)) + **asType**<**real**>(raux3))

→ *[simplify]*

[1.6] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)) + **asType**<**real**>(raux3))

→ *[from term 83.11, raux3 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p3) / 30323.0]*

[1.7] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)) + **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0))

→ *[simplify]*

[1.9] 0.0 < ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0))

→ *[negate goal and search for contradiction]*

[1.10] !(0.0 < ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)))

→ *[simplify]*

[1.17] 0.0 ≤ (−(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))

[Take given term]

[84.0] **asType**<**real**>((**double**)0.0) < **asType**<**real**>(raux1)

→ *[simplify]*

[84.2] 0.0 < **asType**<**real**>(raux1)

→ *[from term 81.11, raux1 is equal to* **real***(***this***.$r.***value***(***heapIs* *$heap*$_{funcend_790,1}$*).p1) / 30269.0]*

[84.3] 0.0 < **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)

→ *[simplify]*

[84.4] 0.0 < (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)

[Take given term]

[85.0] **asType**<**real**>((**double**)0.0) < **asType**<**real**>(raux2)

→ *[simplify]*

[85.2] 0.0 < **asType**<**real**>(raux2)

→ *[from term 82.11, raux2 is equal to* **real***(***this***.$r.***value***(***heapIs* *$heap*$_{funcend_790,1}$*).p2) / 30307.0]*

[85.3] 0.0 < **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)

→ *[simplify]*

[85.4] 0.0 < (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)

[Take given term]

[86.0] **asType**<**real**>((**double**)0.0) < **asType**<**real**>(raux3)

→ *[simplify]*

[86.2] 0.0 < **asType**<**real**>(raux3)

→ *[from term 83.11, raux3 is equal to* **real***(***this***.$r.***value***(***heapIs* *$heap*$_{funcend_790,1}$*).p3) / 30323.0]*

[86.3] 0.0 < **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0)

→ *[simplify]*

[86.4] 0.0 < (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0)

[Create new term from terms 1.17, 86.4 using rule: transitivity 2b]

[206.0] (0.0 + 0.0) < (−(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))

→ *[simplify]*

[206.1] 0.0 < (−(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))

[Create new term from terms 206.1, 85.4 using rule: transitivity 2a]

[217.0] (0.0 + 0.0) < −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)

→ *[simplify]*

[217.1] 0.0 < −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)

→ *[from term 84.4, literala < −(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) is false whenever -0.0 ≤ literala]*

Proof of rule precondition:

[217.1.0] -0.0 ≤ 0.0

→ *[simplify]*

[217.1.1] **true**

[217.2] **false**

Proof of verification condition: Precondition of 'fmod' satisfied

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (98,25)

Condition defined at: C:\Escher\ecv\standard\math.h (84,16)

To prove: !(**asType**<**real**>((**double**)1.0) == **asType**<**real**>((**double**)0.0))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $\$heap_{funcstart_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcstart_790,1}$)

div1 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($\$heap_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $\$heap_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($\$heap_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($\$heap_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($\$heap_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) *

asType<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

$heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))

raux2 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p2)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))

raux3 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux1)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux2)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux3)

asType<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

Proof:

[Take goal term]

[1.0] !(**asType**<**real**>((**double**)1.0) == **asType**<**real**>((**double**)0.0))

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Postcondition satisfied when function 'GetRandom' returns

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (100,9)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (25,33)

To prove: **asType**<**real**>(result) < **asType**<**real**>((**double**)1.0)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$,

this).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$heap$_{790,1;808,8}$ == $heap$_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($heap$_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($heap$_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($heap$_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($heap$_{790,1;808,8}$.M1)

$heap$_{790,1;810,8}$ == $heap$_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($heap$_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($heap$_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($heap$_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($heap$_{790,1;810,8}$.M2)

$heap$_{790,1;812,8}$ == $heap$_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($heap$_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($heap$_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($heap$_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($heap$_{790,1;812,8}$.M3)

$heap$_{790,1;815,8}$ == $heap$_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$\$heap_{790,1;816,8}$ == $\$heap_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;815,8}$, **this**).p2))))

$\$heap_{funcend_790,1}$ == $\$heap_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($\$heap_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $\$heap_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $\$heap_{funcend_790,1}$, **this**).invariant1(**heapIs** $\$heap_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))

raux2 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p2)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2))

raux3 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p3)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M3))

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux1)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux2)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux3)

asType<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

result == fmod(**heapIs** $\$heap_{funcend_790,1}$, (raux1 + raux2) + raux3, (**double**)1.0)

((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>((raux1 + raux2) + raux3)) && (**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>((**double**)1.0))) => ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(result)) && (**asType**<**real**>(result) < **asType**<**real**>((**double**)1.0)))

Proof:

[Take given term]

[81.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))) == raux1

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[81.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs**

$\$heap_{funcend_790,1}$).p1)) /
asType<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))) == raux1

→ *[simplify]*

[81.3] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M1))) == raux1

→ *[const static or extern object]*

[81.4] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>($\$heap_{init}$.M1))) == raux1

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[81.5] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1) /
asType<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30269)))
== raux1

→ *[simplify]*

[81.11] 0.0 == (−raux1 + (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p1)
/ 30269.0))

[Take given term]

[82.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs**
$\$heap_{funcend_790,1}$, **this**).p2)) /
asType<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2))) == raux2

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[82.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs**
$\$heap_{funcend_790,1}$).p2)) /
asType<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2))) == raux2

→ *[simplify]*

[82.3] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) /
asType<**double**>(**static_cast**<**real**>($\$heap_{funcend_790,1}$.M2))) == raux2

→ *[const static or extern object]*

[82.4] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) /
asType<**double**>(**static_cast**<**real**>($\$heap_{init}$.M2))) == raux2

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[82.5] (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2) /
asType<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30307)))
== raux2

→ *[simplify]*

[82.11] 0.0 == (−raux2 + (**real**(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p2)
/ 30307.0))

[Take given term]

[83.0] (**asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[83.1] (**asType**<**double**>(**static_cast**<**real**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[simplify]*

[83.3] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))) == raux3

→ *[const static or extern object]*

[83.4] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>($heap$_{init}$.M3))) == raux3

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[83.5] (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / **asType**<**double**>(**static_cast**<**real**>(**asType**<**short int**>((**int**)30323)))) == raux3

→ *[simplify]*

[83.11] 0.0 == (−raux3 + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0))

[Take given term]

[87.0] **asType**<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[simplify]*

[87.2] 0.0 < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[from term 82.11, raux2 is equal to* **real**(**this**.*$r*.**value**(**heapIs** *$heap$_{funcend_790,1}$).p2) / 30307.0]*

[87.3] 0.0 < ((**asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[simplify]*

[87.4] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

→ *[from term 81.11, raux1 is equal to* **real**(**this**.*$r*.**value**(**heapIs** *$heap$_{funcend_790,1}$).p1) / 30269.0]*

[87.5] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) +

asType<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)) + **asType**<**real**>(raux3))

→ *[simplify]*

[87.6] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)) + **asType**<**real**>(raux3))

→ *[from term 83.11, raux3 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p3) / 30323.0]*

[87.7] 0.0 < (((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)) + **asType**<**real**>(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0))

→ *[simplify]*

[87.9] 0.0 < ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0))

[Take given term]

[88.0] result == fmod(**heapIs** $heap$_{funcend_790,1}$, (raux1 + raux2) + raux3, (**double**)1.0)

→ *[from term 81.11, raux1 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p1) / 30269.0]*

[88.1] result == fmod(**heapIs** $heap$_{funcend_790,1}$, ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + raux2) + raux3, (**double**)1.0)

→ *[from term 82.11, raux2 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p2) / 30307.0]*

[88.2] result == fmod(**heapIs** $heap$_{funcend_790,1}$, ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)) + raux3, (**double**)1.0)

→ *[from term 83.11, raux3 is equal to* **real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p3) / 30323.0]*

[88.3] result == fmod(**heapIs** $heap$_{funcend_790,1}$, ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0)) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0), (**double**)1.0)

→ *[simplify]*

[88.6] 0.0 == (−fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0) + result)

[Assume known post-assertion, class invariant or type constraint for term 88.6]

[91.0] ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))) && (**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(1.0))) => ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0))) && (**asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)) < **asType**<**real**>(1.0)))

→ *[simplify]*

[91.3] ((0.0 ≤ ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0))) && (**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(1.0))) => ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0))) && (**asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)) < **asType**<**real**>(1.0)))

→ *[from term 87.9, literala ≤ ((**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0)) is true whenever literala ≤ 0.0]*

Proof of rule precondition:

[91.3.0] 0.0 ≤ 0.0

→ *[simplify]*

[91.3.1] **true**

[91.4] (**true** && (**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(1.0))) => ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0))) &&

(**asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$,
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) +
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) +
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)) <
asType<**real**>(1.0)))

→ *[simplify]*

[91.21] (-1.0 < −fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)) ∧ (0.0 ≤ fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0))

→ *[separate conjunction and work on first sub-term]*

[91.22] -1.0 < −fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)

[Take goal term]

[1.0] **asType**<**real**>(result) < **asType**<**real**>((**double**)1.0)

→ *[from term 88.6, result is equal to fmod(***heapIs** *$heap$_{funcend_790,1}$,*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p3) / 30323.0) +*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p2) / 30307.0) +*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)]*

[1.1] **asType**<**real**>(fmod(**heapIs** $heap$_{funcend_790,1}$,
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) +
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) +
(**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)) <
asType<**real**>((**double**)1.0)

→ *[simplify]*

[1.7] -1.0 < −fmod(**heapIs** $heap$_{funcend_790,1}$, (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) / 30323.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) / 30307.0) + (**real**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) / 30269.0), 1.0)

→ *[from term 91.22, literala < −fmod(***heapIs** *$heap$_{funcend_790,1}$,*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p3) / 30323.0) +*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p2) / 30307.0) +*
*(***real***(***this***.$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p1) / 30269.0), 1.0) is true whenever literala ≤ -1.0]*

Proof of rule precondition:

[1.7.0] -1.0 $\leq$ -1.0

$\rightarrow$ *[simplify]*

[1.7.1] **true**

[1.8] **true**

Proof of verification condition: Postcondition satisfied when function 'GetRandom' returns

In the context of class: WHPrang, declared at: C:\Escher\Customers\prang-cpp\prang.cpp (17,1)

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (100,9)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (25,52)

To prove: **operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

operator*(**heapIs** $heap$_{funcstart_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcstart_790,1}$)

div1 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1), **asType**<**int**>($heap$_{funcstart_790,1}$.a1))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a1))) == **asType**<**integer**>(div1.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a1)) => (**asType**<**integer**>(div1.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a1) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p1)) => !(0 == **asType**<**integer**>(div1.quot))

!(0 == **asType**<**integer**>(div1.rem)) || !(0 == **asType**<**integer**>(div1.quot))

div2 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2), **asType**<**int**>($heap$_{funcstart_790,1}$.a2))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a2))) == **asType**<**integer**>(div2.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a2)) => (**asType**<**integer**>(div2.rem) == **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2))

(**asType**<**integer**>($heap$_{funcstart_790,1}$.a2) ≤ **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p2)) => !(0 == **asType**<**integer**>(div2.quot))

!(0 == **asType**<**integer**>(div2.rem)) || !(0 == **asType**<**integer**>(div2.quot))

div3 == div(**heapIs** $heap$_{funcstart_790,1}$, **asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3), **asType**<**int**>($heap$_{funcstart_790,1}$.a3))

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) / **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.quot)

(**asType**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3)) % **asType**<**integer**>(**asType**<**int**>($heap$_{funcstart_790,1}$.a3))) == **asType**<**integer**>(div3.rem)

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_790,1}$, **this**).p3) < **asType**<**integer**>($heap$_{funcstart_790,1}$.a3)) => (**asType**<**integer**>(div3.rem) == **asType**<**integer**>(**operator***(**heapIs**

$\$heap_{funcstart_790,1}$, **this**).p3))

(**asType**<**integer**>($\$heap_{funcstart_790,1}$.a3) ≤ **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).p3)) => !(0 == **asType**<**integer**>(div3.quot))

!(0 == **asType**<**integer**>(div3.rem)) || !(0 == **asType**<**integer**>(div3.quot))

$\$heap_{790,1;808,8}$ == $\$heap_{funcstart_790,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{funcstart_790,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div1.rem)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.r1)) − (**asType**<**int**>(**asType**<**short int**>(div1.quot)) * **asType**<**int**>($\$heap_{funcstart_790,1}$.b1)))))

−**asType**<**integer const**>($\$heap_{790,1;808,8}$.M1) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).p1) < **asType**<**integer**>($\$heap_{790,1;808,8}$.M1)

$\$heap_{790,1;810,8}$ == $\$heap_{790,1;808,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;808,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div2.rem)) * **asType**<**int**>($\$heap_{790,1;808,8}$.r2)) − (**asType**<**int**>(**asType**<**short int**>(div2.quot)) * **asType**<**int**>($\$heap_{790,1;808,8}$.b2)))))

−**asType**<**integer const**>($\$heap_{790,1;810,8}$.M2) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).p2) < **asType**<**integer**>($\$heap_{790,1;810,8}$.M2)

$\$heap_{790,1;812,8}$ == $\$heap_{790,1;810,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;810,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**asType**<**short int**>(div3.rem)) * **asType**<**int**>($\$heap_{790,1;810,8}$.r3)) − (**asType**<**int**>(**asType**<**short int**>(div3.quot)) * **asType**<**int**>($\$heap_{790,1;810,8}$.b3)))))

−**asType**<**integer const**>($\$heap_{790,1;812,8}$.M3) < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3)

!(0 == **asType**<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3))

asType<**integer**>(**operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).p3) < **asType**<**integer**>($\$heap_{790,1;812,8}$.M3)

$\$heap_{790,1;815,8}$ == $\$heap_{790,1;812,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{790,1;812,8}$, **this**).**_replace**(p1 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs**

$heap$_{790,1;812,8}$, **this**).p1) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;812,8}$.M1)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;812,8}$, **this**).p1))))

$heap$_{790,1;816,8}$ == $heap$_{790,1;815,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).**_replace**(p2 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;815,8}$.M2)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;815,8}$, **this**).p2))))

$heap$_{funcend_790,1}$ == $heap$_{790,1;816,8}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).**_replace**(p3 → **asType**<**short int**>((**asType**<**int**>(**static_cast**<**integer**>(**asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3) < (**int**)0)) * **asType**<**int**>($heap$_{790,1;816,8}$.M3)) + **asType**<**int**>(**operator***(**heapIs** $heap$_{790,1;816,8}$, **this**).p3))))

operator*(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

raux1 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p1)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M1))

raux2 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p2)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M2))

raux3 == **asType**<**double**>(**static_cast**<**real**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).p3)) / **asType**<**double**>(**static_cast**<**real**>($heap$_{funcend_790,1}$.M3))

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux1)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux2)

asType<**real**>((**double**)0.0) < **asType**<**real**>(raux3)

asType<**real**>((**double**)0.0) < ((**asType**<**real**>(raux2) + **asType**<**real**>(raux1)) + **asType**<**real**>(raux3))

result == fmod(**heapIs** $heap$_{funcend_790,1}$, (raux1 + raux2) + raux3, (**double**)1.0)

((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>((raux1 + raux2) + raux3)) && (**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>((**double**)1.0))) => ((**asType**<**real**>((**double**)0.0) ≤ **asType**<**real**>(result)) && (**asType**<**real**>(result) < **asType**<**real**>((**double**)1.0)))

Proof:

[Take given term]

[75.0] **operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp*

(28,9)]

[75.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.2] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType**<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&

(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.4] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) <
asType<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.5] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<**integer**>($heap$_{funcend_790,1}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[75.6] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<**integer**>($heap$_{init}$.M1))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$,

&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[75.7] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.14] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.15] (((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 <
this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (0 <
asType<integer>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.18] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.19] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.20] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>($heap$_{funcend_790,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[75.21] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[75.22] ((((-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 <

this.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.30] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.31] (((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.34] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[75.35] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) < **asType**<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[75.36] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 <
asType<**integer**>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[75.37] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 <
asType<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[75.38] ((-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)) &&
(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 <
asType<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[75.46] (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3) ∧ (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) ∧ (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[separate conjunction and work on first sub-term]*

[75.47] -30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3

[Work on sub-term 2 of conjunction in term 75.46]

[76.0] -30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2

[Work on sub-term 3 of conjunction in term 75.46]

[77.0] -30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1

[Work on sub-term 4 of conjunction in term 75.46]

[78.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1

[Work on sub-term 5 of conjunction in term 75.46]

[79.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2

[Work on sub-term 6 of conjunction in term 75.46]

[80.0] 0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcend_790,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_790,1}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.1] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcend_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.2] (((((0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcend_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.3] (((((0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) < **asType<integer>**($heap$_{funcend_790,1}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,

&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[from term 78.0, literala <* **this**.*$r*.**value**(**heapIs** *$heap$_{funcend_790,1}$).p1 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.3.0] (-1 + 0) < 0

→ *[simplify]*

[1.3.2] **true**

[1.4] ((((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p1) <
asType<integer>($heap$_{funcend_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.5] ((((**true** && (**asType<integer>**(**this**.$r.**value**(**heapIs**
$heap$_{funcend_790,1}$).p1) < **asType<integer>**($heap$_{funcend_790,1}$.M1))) && (0
< **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.6] ((((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <

asType<integer>($heap$_{funcend_790,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.7] ((((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.8] ((((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <
asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) <
asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.14] ((((**true** && (-30269 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1))
&& (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,
&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) <

asType<integer>($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[from term 77.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p1 is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.14.0] (-30269 + -1) < -30269

→ *[simplify]*

[1.14.2] **true**

[1.15] ((((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.16] (((**true** && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.17] (((**true** && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,

&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.18] (((**true** && (0 < **this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[from term 79.0, literala <* **this**.*$r.***value***(***heapIs** *$heap$_{funcend_790,1}$).p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.18.0] (-1 + 0) < 0

→ *[simplify]*

[1.18.2] **true**

[1.19] (((**true** && **true**) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.20] ((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.21] ((**true** && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2) < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$,

&**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.22] ((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType<integer>**($heap$_{funcend_790,1}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.23] ((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.24] ((**true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[simplify]*

[1.30] ((**true** && (-30307 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcend_790,1}$, &**operator***(**heapIs** $heap$_{funcend_790,1}$, **this**)).p3) < **asType<integer>**($heap$_{funcend_790,1}$.M3))

→ *[from term 76.0, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p2 is true whenever (-1 + literala) < -30307]*

Proof of rule precondition:

[1.30.0] (-30307 + -1) < -30307

→ *[simplify]*

[1.30.2] **true**

[1.31] ((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs**

$\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.32] (**true** && (0 < **asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.33] (**true** && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.34] (**true** && (0 < **this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3)) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[from term 80.0, literala <* **this**.*$r*.**value***(***heapIs** *$heap$_{funcend_790,1}$).p3 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.34.0] (-1 + 0) < 0

→ *[simplify]*

[1.34.2] **true**

[1.35] (**true** && **true**) && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.36] **true** && (**asType**<**integer**>(**operator***(**heapIs** $\$heap_{funcend_790,1}$, &**operator***(**heapIs** $\$heap_{funcend_790,1}$, **this**)).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[Dereference address-of object]*

[1.37] **true** && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3) < **asType**<**integer**>($\$heap_{funcend_790,1}$.M3))

→ *[simplify]*

[1.38] **true** && (**this**.$r.**value**(**heapIs** $\$heap_{funcend_790,1}$).p3 <

asType<integer>($heap$_{funcend_790,1}$.M3))

→ *[const static or extern object]*

[1.39] **true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.40] **true** && (**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[1.46] **true** && (-30323 < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3)

→ *[from term 75.47, literala < −**this**.$r.**value**(**heapIs** $heap$_{funcend_790,1}$).p3 is true whenever (-1 + literala) < -30323]*

Proof of rule precondition:

[1.46.0] (-30323 + -1) < -30323

→ *[simplify]*

[1.46.2] **true**

[1.47] **true** && **true**

→ *[simplify]*

[1.48] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (32,33)

Condition defined at:

To prove: **minof**(**short int**) ≤ (**int**)30269

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) ≤ (**int**)30269

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (32,33)

Condition defined at:

To prove: (**int**)30269 ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)30269 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (33,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)171

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)171

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (33,33)

Condition defined at:

To prove: (**int**)171 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)171 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (34,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)177

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) ≤ (**int**)177

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (34,33)

Condition defined at:

To prove: (**int**)177 ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)177 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (35,33)

Condition defined at:

To prove: minof(**short int**) $\leq$ (**int**)2

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)2

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (35,33)

Condition defined at:

To prove: (**int**)2 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)2 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (37,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)30307

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) ≤ (**int**)30307

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (37,33)

Condition defined at:

To prove: (**int**)30307 ≤ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)30307 ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (38,33)

Condition defined at:

To prove: **minof**(**short int**) ≤ (**int**)172

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)172

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (38,33)

Condition defined at:

To prove: (**int**)172 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)172 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (39,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)176

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)176

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (39,33)

Condition defined at:

To prove: (**int**)176 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)176 ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (40,33)

Condition defined at:

To prove: minof(**short int**) ≤ (**int**)35

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)35

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (40,33)

Condition defined at:

To prove: (**int**)35 $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)35 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (42,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)30323

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)30323

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (42,33)

Condition defined at:

To prove: (**int**)30323 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)30323 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (43,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)170

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)170

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (43,33)

Condition defined at:

To prove: (**int**)170 $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)170 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (44,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)178

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)178

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (44,33)

Condition defined at:

To prove: (**int**)178 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)178 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (45,33)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)63

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)63

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (45,33)

Condition defined at:

To prove: (**int**)63 $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)63 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,25)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)1

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)1

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,25)

Condition defined at:

To prove: (**int**)1 $\leq$ **maxof**(**short int**)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

Proof:

[Take goal term]

[1.0] (**int**)1 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,32)

Condition defined at:

To prove: **minof**(**short int**) $\leq$ (**int**)2

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r $\rightarrow$ **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 $\rightarrow$ **asType**<**short int**>((**int**)1)))

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)2

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,32)

Condition defined at:

To prove: (**int**)2 $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r $\rightarrow$ **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 $\rightarrow$ **asType**<**short int**>((**int**)1)))

Proof:

[Take goal term]

[1.0] (**int**)2 $\leq$ **maxof**(**short int**)

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,39)

Condition defined at:

To prove: minof(**short int**) $\leq$ (**int**)3

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r $\rightarrow$ **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 $\rightarrow$ **asType**<**short int**>((**int**)1)))

$\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,22}$.**_replace**(**this**.$r $\rightarrow$ **operator***(**heapIs** $\$heap_{786,1;786,22}$, **this**).**_replace**(p2 $\rightarrow$ **asType**<**short int**>((**int**)2)))

Proof:

[Take goal term]

[1.0] **minof**(**short int**) $\leq$ (**int**)3

$\rightarrow$ *[simplify]*

[1.3] **true**

Proof of verification condition: Type constraint satisfied in implicit conversion from 'int' to 'short int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (50,39)

Condition defined at:

To prove: (**int**)3 $\leq$ **maxof**(**short int**)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r $\rightarrow$ **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 $\rightarrow$ **asType**<**short int**>((**int**)1)))

$\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,22}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,22}$, **this**).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

Proof:

[Take goal term]

[1.0] (**int**)3 ≤ **maxof**(**short int**)

→ *[simplify]*

[1.3] **true**

Proof of verification condition: Postcondition satisfied when constructor returns

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (52,1)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (20,20)

To prove: operator*(**heapIs** $\$heap_{funcend_786,1}$, **this**).invariant1(**heapIs** $\$heap_{funcend_786,1}$)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**int**)1)))

$\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,22}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,22}$, **this**).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

$\$heap_{funcend_786,1}$ == $\$heap_{786,1;786,29}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,29}$, **this**).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

Proof:

[Take given term]

[2.0] $\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,1,1}$, **this**).**_replace**(p1 → **asType**<**short int**>((**int**)1)))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[2.1] $\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → **asType**<**short int**>((**int**)1)))

→ *[simplify]*

[2.3] $\$heap_{786,1;786,22}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1))

[Take given term]

[3.0] $\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,22}$.**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,22}$, **this**).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

→ *[from term 2.3, $\$heap_{786,1;786,22}$ is equal to $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1))]*

[3.2] $\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **operator***(**heapIs** $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1)), **this**).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[3.3] $\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1))).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

→ *[evaluate dereferenced pointer into modified heap]*

[3.4] $\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1), []: **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$)).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[3.5] $\$heap_{786,1;786,29}$ == $\$heap_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $\$heap_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r

→ ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$)).**_replace**(p2 → **asType**<**short int**>((**int**)2)))

→ *[simplify]*

[3.9] $heap$_{786,1;786,29}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2))

[Take given term]

[4.0] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,29}$.**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{786,1;786,29}$, **this**).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

→ *[from term 3.9, $heap$_{786,1;786,29}$ is equal to $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2))]*

[4.2] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)), **this**).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

→ *[expand definition of operator '*' in class 'pointer' at built in declaration]*

[4.3] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2))).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

→ *[evaluate dereferenced pointer into modified heap]*

[4.4] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)))).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[4.5] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → ([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)))).**_replace**(p3 → **asType**<**short int**>((**int**)3)))

→ *[simplify]*

[4.9] $heap$_{funcend_786,1}$ == $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{funcend_786,1}$, **this**).invariant1(**heapIs** $heap$_{funcend_786,1}$)

→ *[from term 4.9, $heap$_{funcend_786,1}$ is equal to $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))]*

[1.2] **operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**).invariant1(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)))

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.3] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**

$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.4] (((((0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1

→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) <
asType<integer>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) <

asType<integer>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.5] (((((0 < **asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.6] (((((0 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**

$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.13] ((((**true** && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1

→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.14] ((((**true** && (**asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p1) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r

→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.15] ((((**true** && (**asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.16] ((((**true** && (**asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p1) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1

→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) <
asType<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 <
asType<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs**
$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs**
$heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) <
asType<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r
→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →
2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1
→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.22] ((((**true** && (1 <
asType<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →
this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r

→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[const member of object with modified fields]*

[1.25] ((((**true** && (1 < **asType**<**integer**>($heap$_{786,1;786,1,1}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[const static or extern object]*

[1.26] ((((**true** && (1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1

→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.27] ((((**true** && (1 < **asType<integer>**(**asType<short int>**((**int**)30269)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.32] (((**true** && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1

→ 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.33] (((**true** && (0 < **asType<integer>**(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r

→ **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.34] (((**true** && (0 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)))).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.35] (((**true** && (0 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs**

$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.42] ((**true** && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.43] ((**true** && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p2) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.44] ((**true** && (**asType<integer>**(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p2) < **asType<integer>**($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.45] ((**true** && (**asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p2) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.50] ((**true** && (2 < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[const member of object with modified fields]*

[1.53] ((**true** && (2 < **asType**<**integer**>($heap$_{786,1;786,1,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[const static or extern object]*

[1.54] ((**true** && (2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2.**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.55] ((**true** && (2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.60] (**true** && (0 < **asType**<**integer**>(**operator***(**heapIs**

$heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.61] (**true** && (0 < **asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.62] (**true** && (0 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.63] (**true** && (0 < **asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r →

this.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.69] **true** && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), &**operator***(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)), **this**)).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[Dereference address-of object]*

[1.70] **true** && (**asType**<**integer**>(**this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3))).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[evaluate dereferenced pointer into modified heap]*

[1.71] **true** && (**asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), []: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 →

2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[explicitly assert falsehood of skipped guards in subsequent guards]*

[1.72] **true** && (**asType**<**integer**>(([**this**.$r == **this**.$r]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3), [!(**this**.$r == **this**.$r)]: **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)))).p3) < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[simplify]*

[1.76] **true** && (3 < **asType**<**integer**>($heap$_{786,1;786,1,1}$.**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2)).**_replace**(**this**.$r → **this**.$r.**value**(**heapIs** $heap$_{786,1;786,1,1}$).**_replace**(p1 → 1).**_replace**(p2 → 2).**_replace**(p3 → 3)).M3))

→ *[const member of object with modified fields]*

[1.79] **true** && (3 < **asType**<**integer**>($heap$_{786,1;786,1,1}$.M3))

→ *[const static or extern object]*

[1.80] **true** && (3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.81] **true** && (3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[1.86] **true**

Proof of verification condition: Loop initialisation establishes end condition or a valid variant

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (120,5)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (123,20)

To prove: 0 ≤ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count))

Given:

$heap$_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**__alloc**(prang $\rightarrow$ prang)

$\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**__replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

operator*(**heapIs** $\$heap_{844,1;846,13}$,
&$\$heap_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$heap_{844,1;846,13}$)

limit == $\$heap_{844,1;846,13}$.LIMIT

minof(**int const**) $\leq$ limit

limit $\leq$ **maxof**(**int const**)

count == (**int**)0

minof(**int**) $\leq$ count

count $\leq$ **maxof**(**int**)

$\$heap_{844,1;851,5}$ ==
$\$heap_{844,1;846,13}$.**__replace**((&$\$heap_{844,1;846,13}$.__ecv_files[1]).$r $\rightarrow$ writes_851_5)

count < limit

Proof:

[Take given term]

[2.0] $\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**__alloc**(prang $\rightarrow$ prang)

[Take given term]

[3.0] $\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**__replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

$\rightarrow$ *[from term 2.0, $\$heap_{844,1;846,13,m1}$ is equal to*
*$\$heap_{funcstart_844,1}$.**__alloc**(prang $\rightarrow$ prang)]*

[3.1] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[simplify]*

[3.2] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$heap.prang).$r → writes_846_5)

→ *[attribute value is known from postcondition]*

[3.3] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(&$heap.prang → writes_846_5)

→ *[replacing contents of address-of object is same as replacing object]*

[3.4] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)

[Take given term]

[10.0] $\$heap_{844,1;846,13}$.LIMIT == limit

→ *[from term 3.4, $\$heap_{844,1;846,13}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[10.1] $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).LIMIT == limit

→ *[const member of object with modified fields]*

[10.3] $\$heap_{funcstart_844,1}$.LIMIT == limit

→ *[const static or extern object]*

[10.4] $\$heap_{init}$.LIMIT == limit

→ *[expand definition of constant 'LIMIT' at prang.cpp (12,18)]*

[10.5] (**int**)80 == limit

→ *[simplify]*

[10.6] 80 == limit

[Take given term]

[11.0] (**int**)0 == count

→ *[simplify]*

[11.1] 0 == count

[Take goal term]

[1.0] 0 ≤ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count))

→ *[from term 10.6, limit is equal to 80]*

[1.1] 0 ≤ (**asType**<**integer const**>(80) − **asType**<**integer**>(count))

→ *[simplify]*

[1.2] $0 \leq (80 - \textbf{asType<integer>}(\text{count}))$

→ *[from term 11.1, count is equal to 0]*

[1.3] $0 \leq (80 - \textbf{asType<integer>}(0))$

→ *[simplify]*

[1.6] **true**

Proof of verification condition: Loop body establishes end condition or decreases variant

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (124,5)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (123,5)

To prove: $(\textbf{asType<integer const>}(\text{limit}) - \textbf{asType<integer>}(\text{count}_{loopend})) < (\textbf{asType<integer const>}(\text{limit}) - \textbf{asType<integer>}(\text{count}_{loopstart_853,5}))$

Given:

$\$\text{heap}_{init}.\text{LIMIT} == (\textbf{int})80$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{M1} == \textbf{asType<short int>}((\textbf{int})30269)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{r1} == \textbf{asType<short int>}((\textbf{int})171)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{a1} == \textbf{asType<short int>}((\textbf{int})177)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{b1} == \textbf{asType<short int>}((\textbf{int})2)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{M2} == \textbf{asType<short int>}((\textbf{int})30307)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{r2} == \textbf{asType<short int>}((\textbf{int})172)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{a2} == \textbf{asType<short int>}((\textbf{int})176)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{b2} == \textbf{asType<short int>}((\textbf{int})35)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{M3} == \textbf{asType<short int>}((\textbf{int})30323)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{r3} == \textbf{asType<short int>}((\textbf{int})170)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{a3} == \textbf{asType<short int>}((\textbf{int})178)$

$\$\text{heap}_{init}.\textbf{class WHPrang} \in \text{b3} == \textbf{asType<short int>}((\textbf{int})63)$

$\$\text{heap}_{844,1;846,13,m1} == \$\text{heap}_{funcstart_844,1}.\textbf{_alloc}(\text{prang} \rightarrow \text{prang})$

$\$\text{heap}_{844,1;846,13} == \$\text{heap}_{844,1;846,13,m1}.\textbf{_replace}((\&\$\text{heap}_{844,1;846,13,m1}.\text{prang}).\$\text{r} \rightarrow \text{writes_846_5})$

$\textbf{operator*}(\textbf{heapIs}\ \$\text{heap}_{844,1;846,13}, \&\$\text{heap}_{844,1;846,13,m1}.\text{prang}).\text{invariant1}(\textbf{heapIs}\ \$\text{heap}_{844,1;846,13})$

$\text{limit} == \$\text{heap}_{844,1;846,13}.\text{LIMIT}$

$\mathbf{minof}(\mathbf{int\ const}) \leq \mathrm{limit}$

$\mathrm{limit} \leq \mathbf{maxof}(\mathbf{int\ const})$

$\mathrm{count} == (\mathbf{int})0$

$\mathbf{minof}(\mathbf{int}) \leq \mathrm{count}$

$\mathrm{count} \leq \mathbf{maxof}(\mathbf{int})$

$\$\mathrm{heap}_{844,1;851,5} ==$
$\$\mathrm{heap}_{844,1;846,13}._\mathbf{replace}((\&\$\mathrm{heap}_{844,1;846,13}._\mathrm{ecv_files}[1]).\$\mathrm{r} \rightarrow \mathrm{writes_851_5})$

$\$\mathrm{heap}_{loopstart_853,5} == \$\mathrm{heap}_{844,1;851,5}._\mathbf{replace}(\mathrm{prang} \rightarrow$
$\mathrm{writes_854_12})._\mathbf{replace}(_\mathrm{ecv_files} \rightarrow \mathrm{writes_854_12})$

$\#\mathrm{writes_854_12} == \#\$\mathrm{heap}_{844,1;851,5}._\mathrm{ecv_files}$

$\mathbf{minof}(\mathbf{int}) \leq \mathrm{count}_{loopstart_853,5}$

$\mathrm{count}_{loopstart_853,5} \leq \mathbf{maxof}(\mathbf{int})$

$\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang.invariant1}(\mathbf{heapIs}\ \$\mathrm{heap}_{loopstart_853,5})$

$\mathrm{count}_{loopstart_853,5} < \mathrm{limit}$

$0 \leq (\mathbf{asType}<\mathbf{integer\ const}>(\mathrm{limit}) -$
$\mathbf{asType}<\mathbf{integer}>(\mathrm{count}_{loopstart_853,5}))$

$(\mathbf{asType}<\mathbf{integer\ const}>(\mathrm{limit}) - \mathbf{asType}<\mathbf{integer}>(\mathrm{count}_{loopstart_853,5}))$
$\leq (\mathbf{asType}<\mathbf{integer\ const}>(\mathrm{limit}) - \mathbf{asType}<\mathbf{integer}>(\mathrm{count}))$

$(++\mathrm{count}_{loopstart_853,5} == \mathrm{count}_{loopend}) \wedge (\$\mathrm{heap}_{858,16} ==$
$\$\mathrm{heap}_{loopstart_853,5}._\mathbf{replace}((\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang}).\$\mathrm{r} \rightarrow$
$\mathbf{operator}*(\mathbf{heapIs}\ \$\mathrm{heap}_{loopstart_853,5},$
$\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang})._\mathbf{replace}(\mathrm{p1} \rightarrow$
$\mathrm{writes_858_31}))._\mathbf{replace}((\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang}).\$\mathrm{r} \rightarrow$
$\mathbf{operator}*(\mathbf{heapIs}\ \$\mathrm{heap}_{loopstart_853,5},$
$\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang})._\mathbf{replace}(\mathrm{p2} \rightarrow$
$\mathrm{writes_858_31}))._\mathbf{replace}((\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang}).\$\mathrm{r} \rightarrow$
$\mathbf{operator}*(\mathbf{heapIs}\ \$\mathrm{heap}_{loopstart_853,5},$
$\&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang})._\mathbf{replace}(\mathrm{p3} \rightarrow \mathrm{writes_858_31}))) \wedge (\$\mathrm{heap}_{loopend}$
$== \$\mathrm{heap}_{858,16}._\mathbf{replace}((\&\$\mathrm{heap}_{858,16}._\mathrm{ecv_files}[1]).\$\mathrm{r} \rightarrow \mathrm{writes_858_9})) \wedge$
$(\mathbf{asType}<\mathbf{real}>((\mathbf{double})0.0) < \mathbf{asType}<\mathbf{real}>(\$\mathrm{result_858_31})) \wedge$
$(\mathbf{asType}<\mathbf{real}>(\$\mathrm{result_858_31}) < \mathbf{asType}<\mathbf{real}>((\mathbf{double})1.0)) \wedge$
$\mathbf{operator}*(\mathbf{heapIs}\ \$\mathrm{heap}_{858,16},\ \&\$\mathrm{heap}_{loopstart_853,5}.\mathrm{prang}).\mathrm{invariant1}(\mathbf{heapIs}$
$\$\mathrm{heap}_{858,16})$

$\mathrm{count}_{loopend} < \mathrm{limit}$

Proof:

[Take given term]

[2.0] $\$\mathrm{heap}_{844,1;846,13,m1} == \$\mathrm{heap}_{funcstart_844,1}._\mathbf{alloc}(\mathrm{prang} \rightarrow \mathrm{prang})$

[Take given term]

[3.0] $\$heap_{844,1;846,13}$ == $\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[from term 2.0, $\$heap_{844,1;846,13,m1}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang)]*

[3.1] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[simplify]*

[3.2] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$heap.prang).$r → writes_846_5)

→ *[attribute value is known from postcondition]*

[3.3] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(&$heap.prang → writes_846_5)

→ *[replacing contents of address-of object is same as replacing object]*

[3.4] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)

[Take given term]

[10.0] $\$heap_{844,1;846,13}$.LIMIT == limit

→ *[from term 3.4, $\$heap_{844,1;846,13}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[10.1] $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).LIMIT == limit

→ *[const member of object with modified fields]*

[10.3] $\$heap_{funcstart_844,1}$.LIMIT == limit

→ *[const static or extern object]*

[10.4] $\$heap_{init}$.LIMIT == limit

→ *[expand definition of constant 'LIMIT' at prang.cpp (12,18)]*

[10.5] (**int**)80 == limit

→ *[simplify]*

[10.6] 80 == limit

[Take given term]

[25.0] (++$count_{loopstart_853,5}$ == $count_{loopend}$) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$,

&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.8] (1 == (count$_{loopend}$ + −count$_{loopstart_853,5}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p1 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.9] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.10] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**((&$heap.prang).$r →

$\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.11] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$heap.prang) → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.12] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[Dereference address-of object]*

[25.13] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ ==

$\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[simplify]*

[25.14] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.15] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang) → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.16] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$,

&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.17] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.18] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.19] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(&$heap.prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.20] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.21] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.22] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.31] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.32] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 →

writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ $heap$_{858,16}$.prang.invariant1(**heapIs** $heap$_{858,16}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[25.33] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.34] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**($heap$_{858,16}$.prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.35] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1]

→ writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType**<**integer**>($heap$_{858,16}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.36] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && (**asType**<**integer**>($heap$_{858,16}$.prang.p1) < **asType**<**integer**>($heap$_{858,16}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.37] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType**<**integer**>($heap$_{858,16}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.38] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>**($heap$_{init}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[25.39] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>**(**asType<short int>**((**int**)30269)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.46] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.47] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 < **asType**<**integer**>($heap$_{858,16}$.prang.p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.50] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.51] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType**<**integer**>($heap$_{858,16}$.prang.p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.52] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1]

→ writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.53] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[25.54] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.62] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3)))

&& (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.63] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (0 < **asType**<**integer**>($heap$_{858,16}$.prang.p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.66] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.67] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && (**asType**<**integer**>($heap$_{858,16}$.prang.p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.68] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1]

→ writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.69] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType<integer>**($heap$_{init}$.M3)))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[25.70] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType<integer>**(**asType<short int>**((**int**)30323))))

→ *[simplify]*

[25.79] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (-30323 < −$heap$_{858,16}$.prang.p3) ∧ (-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)

→ *[separate conjunction and work on first sub-term]*

[25.80] 1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)

[Take goal term]

[1.0] (**asType<integer const>**(limit) − **asType<integer>**(count$_{loopend}$)) <

(**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[from term 10.6, limit is equal to 80]*

[1.1] (**asType**<**integer const**>(80) − **asType**<**integer**>($\text{count}_{loopend}$)) < (**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[simplify]*

[1.2] (80 − **asType**<**integer**>($\text{count}_{loopend}$)) < (**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[from term 25.80, $\text{count}_{loopend}$ is equal to 1 + $\text{count}_{loopstart_853,5}$]*

[1.3] (80 − **asType**<**integer**>(1 + $\text{count}_{loopstart_853,5}$)) < (**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[simplify]*

[1.9] (79 + −$\text{count}_{loopstart_853,5}$) < (**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[from term 10.6, limit is equal to 80]*

[1.10] (79 + −$\text{count}_{loopstart_853,5}$) < (**asType**<**integer const**>(80) − **asType**<**integer**>($\text{count}_{loopstart_853,5}$))

→ *[simplify]*

[1.22] **true**

Proof of verification condition: Loop body establishes end condition or preserves validity of variant

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (124,5)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (123,20)

To prove: 0 ≤ (**asType**<**integer const**>(limit) − **asType**<**integer**>($\text{count}_{loopend}$))

Given:

$\$\text{heap}_{init}$.LIMIT == (**int**)80

$\$\text{heap}_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$\text{heap}_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$\text{heap}_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$\text{heap}_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$\text{heap}_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$\text{heap}_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$\text{heap}_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)

$\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

operator*(**heapIs** $\$heap_{844,1;846,13}$,
&$\$heap_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$heap_{844,1;846,13}$)

limit == $\$heap_{844,1;846,13}$.LIMIT

minof(**int const**) $\leq$ limit

limit $\leq$ **maxof**(**int const**)

count == (**int**)0

minof(**int**) $\leq$ count

count $\leq$ **maxof**(**int**)

$\$heap_{844,1;851,5}$ ==
$\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r $\rightarrow$ writes_851_5)

$\$heap_{loopstart_853,5}$ == $\$heap_{844,1;851,5}$.**_replace**(prang $\rightarrow$
writes_854_12).**_replace**(_ecv_files $\rightarrow$ writes_854_12)

#writes_854_12 == #$\$heap_{844,1;851,5}$._ecv_files

minof(**int**) $\leq$ $count_{loopstart_853,5}$

$count_{loopstart_853,5}$ $\leq$ **maxof**(**int**)

$\$heap_{loopstart_853,5}$.prang.invariant1(**heapIs** $\$heap_{loopstart_853,5}$)

$count_{loopstart_853,5}$ < limit

0 $\leq$ (**asType**<**integer const**>(limit) $-$
asType<**integer**>($count_{loopstart_853,5}$))

(**asType**<**integer const**>(limit) $-$ **asType**<**integer**>($count_{loopstart_853,5}$))
$\leq$ (**asType**<**integer const**>(limit) $-$ **asType**<**integer**>(count))

(++$count_{loopstart_853,5}$ == $count_{loopend}$) $\wedge$ ($\$heap_{858,16}$ ==
$\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 $\rightarrow$
writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 $\rightarrow$

writes_858_31)).__**replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).__**replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.__**replace**((&$heap$_{858,16}$.__ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

count$_{loopend}$ < limit

Proof:

[Take given term]

[2.0] $heap$_{844,1;846,13,m1}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang)

[Take given term]

[3.0] $heap$_{844,1;846,13}$ == $heap$_{844,1;846,13,m1}$.__**replace**((&$heap$_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[from term 2.0, $heap$_{844,1;846,13,m1}$ is equal to $heap$_{funcstart_844,1}$.__**alloc**(prang → prang)]*

[3.1] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**((&$heap$_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[simplify]*

[3.2] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**((&$heap.prang).$r → writes_846_5)

→ *[attribute value is known from postcondition]*

[3.3] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(&$heap.prang → writes_846_5)

→ *[replacing contents of address-of object is same as replacing object]*

[3.4] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5)

[Take given term]

[10.0] $heap$_{844,1;846,13}$.LIMIT == limit

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5)]*

[10.1] $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5).LIMIT == limit

→ *[const member of object with modified fields]*

[10.3] $heap$_{funcstart_844,1}$.LIMIT == limit

→ *[const static or extern object]*

[10.4] $\$heap_{init}$.LIMIT == limit

→ *[expand definition of constant 'LIMIT' at prang.cpp (12,18)]*

[10.5] (**int**)80 == limit

→ *[simplify]*

[10.6] 80 == limit

[Take given term]

[25.0] (++$count_{loopstart_853,5}$ == $count_{loopend}$) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[simplify]*

[25.8] (1 == ($count_{loopend}$ + −$count_{loopstart_853,5}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[Dereference address-of object]*

[25.9] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 →

writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[simplify]*

[25.10] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap.prang).$r →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.11] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap.prang) →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.12] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==

$\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[Dereference address-of object]*

[25.13] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[simplify]*

[25.14] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.15] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang) → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 →

writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.16] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.17] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.18] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.19] $(1 == (-\text{count}_{loopstart_853,5} + \text{count}_{loopend})) \wedge (\$\text{heap}_{858,16} == \$\text{heap}_{loopstart_853,5}._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p1} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p2} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\&\$\text{heap.prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p3} \rightarrow \text{writes_858_31}))) \wedge (\$\text{heap}_{loopend} == \$\text{heap}_{858,16}._\mathbf{replace}((\&\$\text{heap}_{858,16}._\text{ecv_files}[1]).\$\text{r} \rightarrow \text{writes_858_9})) \wedge (\mathbf{asType}<\mathbf{real}>((\mathbf{double})0.0) < \mathbf{asType}<\mathbf{real}>(\$\text{result_858_31})) \wedge (\mathbf{asType}<\mathbf{real}>(\$\text{result_858_31}) < \mathbf{asType}<\mathbf{real}>((\mathbf{double})1.0)) \wedge \mathbf{operator}^*(\mathbf{heapIs}\ \$\text{heap}_{858,16}, \&\$\text{heap}_{loopstart_853,5}.\text{prang}).\text{invariant1}(\mathbf{heapIs}\ \$\text{heap}_{858,16})$

$\rightarrow$ *[replacing contents of address-of object is same as replacing object]*

[25.20] $(1 == (-\text{count}_{loopstart_853,5} + \text{count}_{loopend})) \wedge (\$\text{heap}_{858,16} == \$\text{heap}_{loopstart_853,5}._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p1} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p2} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p3} \rightarrow \text{writes_858_31}))) \wedge (\$\text{heap}_{loopend} == \$\text{heap}_{858,16}._\mathbf{replace}((\&\$\text{heap}_{858,16}._\text{ecv_files}[1]).\$\text{r} \rightarrow \text{writes_858_9})) \wedge (\mathbf{asType}<\mathbf{real}>((\mathbf{double})0.0) < \mathbf{asType}<\mathbf{real}>(\$\text{result_858_31})) \wedge (\mathbf{asType}<\mathbf{real}>(\$\text{result_858_31}) < \mathbf{asType}<\mathbf{real}>((\mathbf{double})1.0)) \wedge \mathbf{operator}^*(\mathbf{heapIs}\ \$\text{heap}_{858,16}, \&\$\text{heap}_{loopstart_853,5}.\text{prang}).\text{invariant1}(\mathbf{heapIs}\ \$\text{heap}_{858,16})$

$\rightarrow$ *[simplify]*

[25.21] $(1 == (-\text{count}_{loopstart_853,5} + \text{count}_{loopend})) \wedge (\$\text{heap}_{858,16} == \$\text{heap}_{loopstart_853,5}._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p1} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p2} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p3} \rightarrow \text{writes_858_31}))) \wedge (\$\text{heap}_{loopend} == \$\text{heap}_{858,16}._\mathbf{replace}((\&\$\text{heap}._\text{ecv_files}[1]).\$\text{r} \rightarrow \text{writes_858_9})) \wedge (\mathbf{asType}<\mathbf{real}>((\mathbf{double})0.0) < \mathbf{asType}<\mathbf{real}>(\$\text{result_858_31})) \wedge (\mathbf{asType}<\mathbf{real}>(\$\text{result_858_31}) < \mathbf{asType}<\mathbf{real}>((\mathbf{double})1.0)) \wedge \mathbf{operator}^*(\mathbf{heapIs}\ \$\text{heap}_{858,16}, \&\$\text{heap}_{loopstart_853,5}.\text{prang}).\text{invariant1}(\mathbf{heapIs}\ \$\text{heap}_{858,16})$

$\rightarrow$ *[attribute value is known from postcondition]*

[25.22] $(1 == (-\text{count}_{loopstart_853,5} + \text{count}_{loopend})) \wedge (\$\text{heap}_{858,16} == \$\text{heap}_{loopstart_853,5}._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p1} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p2} \rightarrow \text{writes_858_31}))._\mathbf{replace}(\text{prang} \rightarrow \$\text{heap}_{loopstart_853,5}.\text{prang}._\mathbf{replace}(\text{p3} \rightarrow \text{writes_858_31}))) \wedge (\$\text{heap}_{loopend} == \$\text{heap}_{858,16}._\mathbf{replace}(\&\$\text{heap}._\text{ecv_files}[1] \rightarrow \text{writes_858_9})) \wedge (\mathbf{asType}<\mathbf{real}>((\mathbf{double})0.0) < \mathbf{asType}<\mathbf{real}>(\$\text{result_858_31})) \wedge (\mathbf{asType}<\mathbf{real}>(\$\text{result_858_31}) < \mathbf{asType}<\mathbf{real}>((\mathbf{double})1.0)) \wedge \mathbf{operator}^*(\mathbf{heapIs}\ \$\text{heap}_{858,16}, \&\$\text{heap}_{loopstart_853,5}.\text{prang}).\text{invariant1}(\mathbf{heapIs}\ \$\text{heap}_{858,16})$

$\rightarrow$ *[simplify]*

[25.31] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.32] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ $heap$_{858,16}$.prang.invariant1(**heapIs** $heap$_{858,16}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[25.33] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.34] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**($heap$_{858,16}$.prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 <

asType<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.35] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType**<**integer**>($heap$_{858,16}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.36] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && (**asType**<**integer**>($heap$_{858,16}$.prang.p1) < **asType**<**integer**>($heap$_{858,16}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.37] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 <

$result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.38] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>**($heap$_{init}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[25.39] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>**(**asType<short int>**((**int**)30269)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.46] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.47] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 < **asType<integer>**($heap$_{858,16}$.prang.p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.50] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.51] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧

(((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType<integer>**($heap$_{858,16}$.prang.p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.52] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.53] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[25.54] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3)))

&& (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.62] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.63] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (0 < **asType**<**integer**>($heap$_{858,16}$.prang.p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.66] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.67] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && (**asType**<**integer**>($heap$_{858,16}$.prang.p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.68] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.69] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType**<**integer**>($heap$_{init}$.M3)))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[25.70] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323))))

→ *[simplify]*

[25.79] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (-30323 < −$heap$_{858,16}$.prang.p3) ∧ (-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)

→ *[separate conjunction and work on first sub-term]*

[25.80] 1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)

[Take given term]

[44.0] count$_{loopend}$ < limit

→ *[from term 25.80, count$_{loopend}$ is equal to 1 + count$_{loopstart_853,5}$]*

[44.1] (1 + count$_{loopstart_853,5}$) < limit

→ *[from term 10.6, limit is equal to 80]*

[44.2] (1 + count$_{loopstart_853,5}$) < 80

→ *[simplify]*

[44.9] -79 < −count$_{loopstart_853,5}$

[Take goal term]

[1.0] 0 ≤ (**asType<integer const>**(limit) − **asType<integer>**(count$_{loopend}$))

→ *[from term 10.6, limit is equal to 80]*

[1.1] 0 ≤ (**asType<integer const>**(80) − **asType<integer>**(count$_{loopend}$))

→ *[simplify]*

[1.2] 0 ≤ (80 − **asType<integer>**(count$_{loopend}$))

→ *[from term 25.80, count$_{loopend}$ is equal to 1 + count$_{loopstart_853,5}$]*

[1.3] 0 ≤ (80 − **asType<integer>**(1 + count$_{loopstart_853,5}$))

→ *[simplify]*

[1.13] -80 < −count$_{loopstart_853,5}$

→ *[from term 44.9, literala < −count$_{loopstart_853,5}$ is true whenever (-1 + literala) < -79]*

Proof of rule precondition:

[1.13.0] (-80 + -1) < -79

→ *[simplify]*

[1.13.2] **true**

[1.14] **true**

Proof of verification condition: Loop body preserves loop invariant

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (124,5)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (122,16)

To prove: $\$heap_{loopend}$.prang.invariant1(**heapIs** $\$heap_{loopend}$)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang)

$\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

operator*(**heapIs** $\$heap_{844,1;846,13}$,
&$\$heap_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$heap_{844,1;846,13}$)

limit == $\$heap_{844,1;846,13}$.LIMIT

minof(**int const**) ≤ limit

limit ≤ **maxof**(**int const**)

count == (**int**)0

minof(**int**) ≤ count

count ≤ **maxof**(**int**)

$\$heap_{844,1;851,5}$ ==
$\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r → writes_851_5)

$\$heap_{loopstart_853,5}$ == $\$heap_{844,1;851,5}$.**_replace**(prang →
writes_854_12).**_replace**(_ecv_files → writes_854_12)

#writes_854_12 == #$heap$_{844,1;851,5}$._ecv_files

minof(**int**) $\leq$ count$_{loopstart_853,5}$

count$_{loopstart_853,5}$ $\leq$ **maxof**(**int**)

$heap$_{loopstart_853,5}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$)

count$_{loopstart_853,5}$ < limit

0 $\leq$ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count$_{loopstart_853,5}$))

(**asType**<**integer const**>(limit) − **asType**<**integer**>(count$_{loopstart_853,5}$)) $\leq$ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count))

(++count$_{loopstart_853,5}$ == count$_{loopend}$) $\wedge$ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$._**replace**((&$heap$_{loopstart_853,5}$.prang).$r $\rightarrow$ **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang)._**replace**(p1 $\rightarrow$ writes_858_31))._**replace**((&$heap$_{loopstart_853,5}$.prang).$r $\rightarrow$ **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang)._**replace**(p2 $\rightarrow$ writes_858_31))._**replace**((&$heap$_{loopstart_853,5}$.prang).$r $\rightarrow$ **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang)._**replace**(p3 $\rightarrow$ writes_858_31))) $\wedge$ ($heap$_{loopend}$ == $heap$_{858,16}$._**replace**((&$heap$_{858,16}$._ecv_files[1]).$r $\rightarrow$ writes_858_9)) $\wedge$ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) $\wedge$ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) $\wedge$ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

Proof:

[Take given term]

[17.0] $heap$_{loopstart_853,5}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$)

$\rightarrow$ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[17.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.2] (((((0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.3] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.4] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType<integer>**($heap$_{loopstart_853,5}$.prang.p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.5] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && ($heap$_{loopstart_853,5}$.prang.p1 < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**

$\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2) < **asType<integer>**($\$heap_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.6] (((((0 < $\$heap_{loopstart_853,5}$.prang.p1) && ($\$heap_{loopstart_853,5}$.prang.p1 < **asType<integer>**($\$heap_{init}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2) < **asType<integer>**($\$heap_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[17.7] (((((0 < $\$heap_{loopstart_853,5}$.prang.p1) && ($\$heap_{loopstart_853,5}$.prang.p1 < **asType<integer>**(**asType<short int>**((**int**)30269)))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2) < **asType<integer>**($\$heap_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.14] (((((-30269 < −$\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p2) < **asType<integer>**($\$heap_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.15] (((((-30269 < −$\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1)) && (0 <

asType<**integer**>($heap$_{loopstart_853,5}$.prang.p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.18] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.19] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType**<**integer**>($heap$_{loopstart_853,5}$.prang.p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.20] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.21] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) <

asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[17.22] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.30] (((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.31] (((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.34] ((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.35] ((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p3)) && (**asType<integer>**($heap$_{loopstart_853,5}$.prang.p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.36] ((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 <

$-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && ($\$heap_{loopstart_853,5}$.prang.p3 < **asType**<**integer**>($\$heap_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.37] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && ($\$heap_{loopstart_853,5}$.prang.p3 < **asType**<**integer**>($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[17.38] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && ($\$heap_{loopstart_853,5}$.prang.p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[17.46] (-30323 < $-\$heap_{loopstart_853,5}$.prang.p3) ∧ (-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)

[Work on sub-term 2 of conjunction in term 17.46]

[18.0] -30307 < $-\$heap_{loopstart_853,5}$.prang.p2

[Work on sub-term 3 of conjunction in term 17.46]

[19.0] -30269 < $-\$heap_{loopstart_853,5}$.prang.p1

[Work on sub-term 4 of conjunction in term 17.46]

[20.0] 0 < $\$heap_{loopstart_853,5}$.prang.p1

[Work on sub-term 5 of conjunction in term 17.46]

[21.0] 0 < $\$heap_{loopstart_853,5}$.prang.p2

[Take given term]

[25.0] (++$count_{loopstart_853,5}$ == $count_{loopend}$) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧

(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[simplify]*

[25.8] (1 == (count$_{loopend}$ + −count$_{loopstart_853,5}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$.**_**ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.9] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$.**_**ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[simplify]*

[25.10] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap.prang).$r →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →

operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.11] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**((&$heap.prang) →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.12] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$
== $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧
(**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧
(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧
operator*(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**
$heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.13] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 →
writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r →
operator*(**heapIs** $heap$_{loopstart_853,5}$,

&$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.14] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang).$r → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.15] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**((&$heap.prang) → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.16] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap$_{loopstart_853,5}$.prang).$r → **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap$_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs**

$\$heap_{858,16}$)

→ *[Dereference address-of object]*

[25.17] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[simplify]*

[25.18] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**((&$heap.prang).$r → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.19] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(&$heap.prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

→ *[replacing contents of address-of object is same as replacing object]*

[25.20] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧

(**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.21] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**((&$heap.**_**ecv_files[1]).$r → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[attribute value is known from postcondition]*

[25.22] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (**asType**<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)) ∧ (**asType**<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[simplify]*

[25.31] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ **operator***(**heapIs** $heap$_{858,16}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{858,16}$)

→ *[Dereference address-of object]*

[25.32] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ $heap$_{858,16}$.prang.invariant1(**heapIs** $heap$_{858,16}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp*

(28,9)]

[25.33] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.34] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < **asType<integer>**($heap$_{858,16}$.prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.35] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p1) < **asType<integer>**($heap$_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**

$\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p2) < **asType<integer>**($\$heap_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.36] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$\$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $\$heap_{858,16}$.prang.p1) && (**asType<integer>**($\$heap_{858,16}$.prang.p1) < **asType<integer>**($\$heap_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p2) < **asType<integer>**($\$heap_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[simplify]*

[25.37] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$\$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $\$heap_{858,16}$.prang.p1) && ($\$heap_{858,16}$.prang.p1 < **asType<integer>**($\$heap_{858,16}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p2) < **asType<integer>**($\$heap_{858,16}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[const static or extern object]*

[25.38] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$\$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $\$heap_{858,16}$.prang.p1) && ($\$heap_{858,16}$.prang.p1 < **asType<integer>**($\$heap_{init}$.M1))) && (0 <

asType<integer>(operator*(heapIs $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[25.39] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((0 < $heap$_{858,16}$.prang.p1) && ($heap$_{858,16}$.prang.p1 < **asType<integer>(asType<short int>((int)**30269)))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.46] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 < **asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType<integer>**($heap$_{858,16}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType<integer>**($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.47] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1)) && (0 <

asType<**integer**>($heap$_{858,16}$.prang.p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.50] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.51] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (**asType**<**integer**>($heap$_{858,16}$.prang.p2) < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.52] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_**ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>($heap$_{858,16}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3)))

&& (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[const static or extern object]*

[25.53] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[25.54] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((((-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && ($heap$_{858,16}$.prang.p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[simplify]*

[25.62] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap.**_ecv_files**[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{858,16}$, &$heap$_{858,16}$.prang).p3) < **asType**<**integer**>($heap$_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.63] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ ==

$\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ ((((-30307 < −$\$heap_{858,16}$.prang.p2) ∧ (-30269 < −$\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p2)) && (0 < **asType<integer>**($\$heap_{858,16}$.prang.p3))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[simplify]*

[25.66] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$\$heap_{858,16}$.prang.p2) ∧ (-30269 < −$\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p2) ∧ (0 < $\$heap_{858,16}$.prang.p3)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{858,16}$, &$\$heap_{858,16}$.prang).p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[Dereference address-of object]*

[25.67] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$\$heap_{858,16}$.prang.p2) ∧ (-30269 < −$\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p2) ∧ (0 < $\$heap_{858,16}$.prang.p3)) && (**asType<integer>**($\$heap_{858,16}$.prang.p3) < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[simplify]*

[25.68] (1 == (−$count_{loopstart_853,5}$ + $count_{loopend}$)) ∧ ($\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $\$heap_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$\$heap_{858,16}$.prang.p2) ∧ (-30269 < −$\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p1) ∧ (0 < $\$heap_{858,16}$.prang.p2) ∧ (0 < $\$heap_{858,16}$.prang.p3)) && ($\$heap_{858,16}$.prang.p3 < **asType<integer>**($\$heap_{858,16}$.M3)))

→ *[const static or extern object]*

[25.69] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType<integer>**($heap$_{init}$.M3)))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[25.70] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (((-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)) && ($heap$_{858,16}$.prang.p3 < **asType<integer>**(**asType<short int>**((**int**)30323))))

→ *[simplify]*

[25.79] (1 == (−count$_{loopstart_853,5}$ + count$_{loopend}$)) ∧ ($heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))) ∧ ($heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)) ∧ (0.0 < $result_858_31) ∧ (-1.0 < −$result_858_31) ∧ (-30323 < −$heap$_{858,16}$.prang.p3) ∧ (-30307 < −$heap$_{858,16}$.prang.p2) ∧ (-30269 < −$heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p1) ∧ (0 < $heap$_{858,16}$.prang.p2) ∧ (0 < $heap$_{858,16}$.prang.p3)

[Work on sub-term 2 of conjunction in term 25.79]

[26.0] $heap$_{858,16}$ == $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31))

[Work on sub-term 3 of conjunction in term 25.79]

[27.0] $heap$_{loopend}$ == $heap$_{858,16}$.**_replace**(&$heap._ecv_files[1] → writes_858_9)

→ *[from term 26.0, $heap$_{858,16}$ is equal to $heap$_{loopstart_853,5}$.**_replace**(prang*

→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p1 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p2 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p3 → writes_858_31))]*

[27.1] $heap$_{loopend}$ == $heap$_{loopstart_853,5}$._**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p1 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p2 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p3 →
writes_858_31)).**replace**(&$heap._ecv_files[1] → writes_858_9)

[Work on sub-term 4 of conjunction in term 25.79]

[28.0] -30323 < −$heap$_{858,16}$.prang.p3

→ *[from term 26.0, $heap$_{858,16}$ is equal to $heap$_{loopstart_853,5}$.*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p1 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p2 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p3 → writes_858_31))]*

[28.1] -30323 < −$heap$_{loopstart_853,5}$._**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p1 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p2 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p3 → writes_858_31)).prang.p3

→ *[simplify]*

[28.3] -30323 < −writes_858_31

[Work on sub-term 9 of conjunction in term 25.79]

[33.0] 0 < $heap$_{858,16}$.prang.p3

→ *[from term 26.0, $heap$_{858,16}$ is equal to $heap$_{loopstart_853,5}$.*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p1 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p2 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p3 → writes_858_31))]*

[33.1] 0 < $heap$_{loopstart_853,5}$._**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p1 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p2 → writes_858_31)).**replace**(prang →
$heap$_{loopstart_853,5}$.prang._**replace**(p3 → writes_858_31)).prang.p3

→ *[simplify]*

[33.3] 0 < writes_858_31

[Take goal term]

[1.0] $heap$_{loopend}$.prang.invariant1(**heapIs** $heap$_{loopend}$)

→ *[from term 27.1, $heap$_{loopend}$ is equal to $heap$_{loopstart_853,5}$.*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p1 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p2 → writes_858_31)).*_**replace***(prang*
→ *$heap$_{loopstart_853,5}$.prang.*_**replace***(p3 →*
*writes_858_31)).*_**replace***(&$heap._ecv_files[1] → writes_858_9)]*

[1.1] $heap$_{loopend}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9))

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.2] (((((0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**

$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.3] (((((0 < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p1) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang

→ $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.7] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang

→ $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[from term 20.0, literala < $heap$_{loopstart_853,5}$.prang.p1 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.7.0] (-1 + 0) < 0

→ *[simplify]*

[1.7.2] **true**

[1.8] ((((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang →

$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.9] ((((**true** && (**asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p1) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →

$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0
< **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3
→ writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.13] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M1))) && (0
< **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3
→ writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p2) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0
< **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang
→ $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[const member of object with modified fields]*

[1.17] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →

$heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[const static or extern object]*

[1.18] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType<integer>**($heap$_{init}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.19] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType<integer>**(**asType<short int>**((**int**)30269)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.25] ((((**true** && (-30269 < −$heap$_{loopstart_853,5}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[from term 19.0, literala < −$heap$_{loopstart_853,5}$.prang.p1 is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.25.0] (-30269 + -1) < -30269

→ *[simplify]*

[1.25.2] **true**

[1.26] ((((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 →

writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.27] (((**true** && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.28] (((**true** && (0 < **asType**<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.32] (((**true** && (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →

$heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[from term 21.0, literala < $heap$_{loopstart_853,5}$.prang.p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.32.0] (-1 + 0) < 0

→ *[simplify]*

[1.32.2] **true**

[1.33] (((**true** && **true**) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.34] ((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.35] ((**true** && (**asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p2) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →

$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.39] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[const member of object with modified fields]*

[1.43] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 <

asType<integer>($heap$_{loopstart_853,5}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3
→ writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[const static or extern object]*

[1.44] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 <
asType<integer>($heap$_{init}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2
→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3
→ writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),
&$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.45] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 <
asType<integer>(**asType<short int>**((**int**)30307)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang →
$heap$_{loopstart_853,5}$.prang.**_replace**(p3 →
writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9),

&$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.51] ((**true** && (-30307 < −$heap$_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[from term 18.0, literala < −$heap$_{loopstart_853,5}$.prang.p2 is true whenever (-1 + literala) < -30307]*

Proof of rule precondition:

[1.51.0] (-30307 + -1) < -30307

→ *[simplify]*

[1.51.2] **true**

[1.52] ((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1

→ writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.53] (**true** && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.54] (**true** && (0 < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.58] (**true** && (0 < writes_858_31)) &&
(**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[from term 33.3, literala < writes_858_31 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.58.0] (-1 + 0) < 0

→ *[simplify]*

[1.58.2] **true**

[1.59] (**true** && **true**) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.60] **true** && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**(&$heap._ecv_files[1] → writes_858_9), &$heap$_{loopend}$.prang).p3) <
asType<**integer**>($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[Dereference address-of object]*

[1.61] **true** && (**asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).prang.p3) < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[simplify]*

[1.65] **true** && (writes_858_31 < **asType<integer>**($heap$_{loopstart_853,5}$.**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p1 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p2 → writes_858_31)).**_replace**(prang → $heap$_{loopstart_853,5}$.prang.**_replace**(p3 → writes_858_31)).**_replace**((&$heap._ecv_files[1]) → writes_858_9).M3))

→ *[const member of object with modified fields]*

[1.69] **true** && (writes_858_31 < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[1.70] **true** && (writes_858_31 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.71] **true** && (writes_858_31 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[1.77] **true** && (-30323 < −writes_858_31)

→ *[from term 28.3, literala < −writes_858_31 is true whenever (-1 + literala) < -30323]*

Proof of rule precondition:

[1.77.0] (-30323 + -1) < -30323

→ *[simplify]*

[1.77.2] **true**

[1.78] **true** && **true**

→ *[simplify]*

[1.79] **true**

Proof of verification condition: Precondition of 'GetRandom' satisfied

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (125,31)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (24,13)

To prove: **operator***(**heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{loopstart_853,5}$)

Given:

$\$heap_{init}$.LIMIT == (**int**)80

$\$heap_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$heap_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$heap_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$heap_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$heap_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$heap_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$heap_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$heap_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$heap_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$heap_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang)

$\$heap_{844,1;846,13}$ == $\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

operator*(**heapIs** $\$heap_{844,1;846,13}$, &$\$heap_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$heap_{844,1;846,13}$)

limit == $\$heap_{844,1;846,13}$.LIMIT

minof(**int const**) ≤ limit

limit ≤ **maxof**(**int const**)

count == (**int**)0

minof(**int**) ≤ count

count ≤ **maxof**(**int**)

$\$heap_{844,1;851,5}$ == $\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r → writes_851_5)

$\$heap_{loopstart_853,5}$ == $\$heap_{844,1;851,5}$.**_replace**(prang →

writes_854_12).**_replace**(_ecv_files → writes_854_12)

#writes_854_12 == #$heap$_{844,1;851,5}$._ecv_files

minof(**int**) ≤ count$_{loopstart_853,5}$

count$_{loopstart_853,5}$ ≤ **maxof**(**int**)

$heap$_{loopstart_853,5}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$)

count$_{loopstart_853,5}$ < limit

0 ≤ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count$_{loopstart_853,5}$))

(**asType**<**integer const**>(limit) − **asType**<**integer**>(count$_{loopstart_853,5}$)) ≤ (**asType**<**integer const**>(limit) − **asType**<**integer**>(count))

Proof:

[Take given term]

[17.0] $heap$_{loopstart_853,5}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[17.1] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.2] (((((0 < **asType**<**integer**>($heap$_{loopstart_853,5}$.prang.p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.3] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.4] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType**<**integer**>($heap$_{loopstart_853,5}$.prang.p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.5] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && ($heap$_{loopstart_853,5}$.prang.p1 < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.6] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && ($heap$_{loopstart_853,5}$.prang.p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 <

asType<integer>(operator*(heapIs $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[17.7] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && ($heap$_{loopstart_853,5}$.prang.p1 < **asType<integer>(asType<short int>((int)**30269)))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.14] (((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1)) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.15] (((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1)) && (0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p2))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.18] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) <

asType<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.19] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType**<**integer**>($heap$_{loopstart_853,5}$.prang.p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.20] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.21] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType**<**integer**>($heap$_{init}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[17.22] ((((-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2)) && ($heap$_{loopstart_853,5}$.prang.p2 < **asType**<**integer**>(**asType**<**short int**>((**int**)30307)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.30] (((-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 <

$-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>(operator*(heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.31] (((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>**($\$heap_{loopstart_853,5}$.prang.p3))) && (**asType<integer>(operator*(heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.34] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && (**asType<integer>(operator*(heapIs** $\$heap_{loopstart_853,5}$, &$\$heap_{loopstart_853,5}$.prang).p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[17.35] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && (**asType<integer>**($\$heap_{loopstart_853,5}$.prang.p3) < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[simplify]*

[17.36] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && ($\$heap_{loopstart_853,5}$.prang.p3 < **asType<integer>**($\$heap_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[17.37] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) && ($\$heap_{loopstart_853,5}$.prang.p3 < **asType<integer>**($\$heap_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[17.38] ((-30307 < $-\$heap_{loopstart_853,5}$.prang.p2) ∧ (-30269 < $-\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p1) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p2) ∧ (0 < $\$heap_{loopstart_853,5}$.prang.p3)) &&

($heap$_{loopstart_853,5}$.prang.p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[17.46] (-30323 < −$heap$_{loopstart_853,5}$.prang.p3) ∧ (-30307 < −$heap$_{loopstart_853,5}$.prang.p2) ∧ (-30269 < −$heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p1) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p2) ∧ (0 < $heap$_{loopstart_853,5}$.prang.p3)

→ *[separate conjunction and work on first sub-term]*

[17.47] -30323 < −$heap$_{loopstart_853,5}$.prang.p3

[Work on sub-term 2 of conjunction in term 17.46]

[18.0] -30307 < −$heap$_{loopstart_853,5}$.prang.p2

[Work on sub-term 3 of conjunction in term 17.46]

[19.0] -30269 < −$heap$_{loopstart_853,5}$.prang.p1

[Work on sub-term 4 of conjunction in term 17.46]

[20.0] 0 < $heap$_{loopstart_853,5}$.prang.p1

[Work on sub-term 5 of conjunction in term 17.46]

[21.0] 0 < $heap$_{loopstart_853,5}$.prang.p2

[Work on sub-term 6 of conjunction in term 17.46]

[22.0] 0 < $heap$_{loopstart_853,5}$.prang.p3

[Take goal term]

[1.0] **operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).invariant1(**heapIs** $heap$_{loopstart_853,5}$)

→ *[Dereference address-of object]*

[1.1] $heap$_{loopstart_853,5}$.prang.invariant1(**heapIs** $heap$_{loopstart_853,5}$)

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.2] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) <

asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.3] (((((0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p1)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.4] (((((0 < $heap$_{loopstart_853,5}$.prang.p1) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[from term 20.0, literala < $heap$_{loopstart_853,5}$.prang.p1 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.4.0] (-1 + 0) < 0

→ *[simplify]*

[1.4.2] **true**

[1.5] ((((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p1) < **asType<integer>**($heap$_{loopstart_853,5}$.M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$,

&$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.6] ((((**true** && (**asType**<**integer**>($heap$_{loopstart_853,5}$.prang.p1) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.7] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType**<**integer**>($heap$_{loopstart_853,5}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[1.8] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType**<**integer**>($heap$_{init}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType**<**integer**>($heap$_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.9] ((((**true** && ($heap$_{loopstart_853,5}$.prang.p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) <

asType<integer>($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.15] ((((**true** && (-30269 < −$heap$_{loopstart_853,5}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[from term 19.0, literala < −$heap$_{loopstart_853,5}$.prang.p1 is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.15.0] (-30269 + -1) < -30269

→ *[simplify]*

[1.15.2] **true**

[1.16] ((((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.17] (((**true** && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.18] (((**true** && (0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.19] (((**true** && (0 < $heap$_{loopstart_853,5}$.prang.p2)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[from term 21.0, literala < $heap$_{loopstart_853,5}$.prang.p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.19.0] (-1 + 0) < 0

→ *[simplify]*

[1.19.2] **true**

[1.20] (((**true** && **true**) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.21] ((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.22] ((**true** && (**asType<integer>**($heap$_{loopstart_853,5}$.prang.p2) < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 <

asType<integer>(operator*(heapIs $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.23] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 < **asType<integer>**($heap$_{loopstart_853,5}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[1.24] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.25] ((**true** && ($heap$_{loopstart_853,5}$.prang.p2 < **asType<integer>(asType<short int>((int)**30307)))) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.31] ((**true** && (-30307 < −$heap$_{loopstart_853,5}$.prang.p2)) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) < **asType<integer>**($heap$_{loopstart_853,5}$.M3))

→ *[from term 18.0, literala < −$heap$_{loopstart_853,5}$.prang.p2 is true whenever (-1 + literala) < -30307]*

Proof of rule precondition:

[1.31.0] (-30307 + -1) < -30307

→ *[simplify]*

[1.31.2] **true**

[1.32] ((**true** && **true**) && (0 < **asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) && (**asType<integer>(operator*(heapIs** $heap$_{loopstart_853,5}$,

&$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.33] (**true** && (0 < **asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.34] (**true** && (0 < **asType<integer>**($heap$_{loopstart_853,5}$.prang.p3))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.35] (**true** && (0 < $heap$_{loopstart_853,5}$.prang.p3)) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[from term 22.0, literala < $heap$_{loopstart_853,5}$.prang.p3 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.35.0] (-1 + 0) < 0

→ *[simplify]*

[1.35.2] **true**

[1.36] (**true** && **true**) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{loopstart_853,5}$, &$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.37] **true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{loopstart_853,5}$,
&$heap$_{loopstart_853,5}$.prang).p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[Dereference address-of object]*

[1.38] **true** && (**asType<integer>**($heap$_{loopstart_853,5}$.prang.p3) <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[simplify]*

[1.39] **true** && ($heap$_{loopstart_853,5}$.prang.p3 <
asType<integer>($heap$_{loopstart_853,5}$.M3))

→ *[const static or extern object]*

[1.40] **true** && ($heap$_{loopstart_853,5}$.prang.p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.41] **true** && ($heap$_{loopstart_853,5}$.prang.p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[1.47] **true** && (-30323 < −$heap$_{loopstart_853,5}$.prang.p3)

→ *[from term 17.47, literala < −$heap$_{loopstart_853,5}$.prang.p3 is true whenever (-1 + literala) < -30323]*

Proof of rule precondition:

[1.47.0] (-30323 + -1) < -30323

→ *[simplify]*

[1.47.2] **true**

[1.48] **true** && **true**

→ *[simplify]*

[1.49] **true**

Proof of verification condition: Arithmetic result of operator '++' is within limit of type 'int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (126,9)

Condition defined at:

To prove: **minof**(**int**) ≤ ++count$_{loopstart_853,5}$

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang ∈ M1 == **asType<short int>**((**int**)30269)

$heap$_{init}$.**class** WHPrang ∈ r1 == **asType<short int>**((**int**)171)

$heap$_{init}$.**class** WHPrang ∈ a1 == **asType<short int>**((**int**)177)

$heap$_{init}$.**class** WHPrang ∈ b1 == **asType<short int>**((**int**)2)

$heap$_{init}$.**class** WHPrang ∈ M2 == **asType<short int>**((**int**)30307)

$heap$_{init}$.**class** WHPrang ∈ r2 == **asType<short int>**((**int**)172)

$heap$_{init}$.**class** WHPrang ∈ a2 == **asType<short int>**((**int**)176)

$heap$_{init}$.**class** WHPrang ∈ b2 == **asType<short int>**((**int**)35)

$heap$_{init}$.**class** WHPrang ∈ M3 == **asType<short int>**((**int**)30323)

$\$heap_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$\$heap_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$\$heap_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)

$\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

operator*(**heapIs** $\$heap_{844,1;846,13}$,
&$\$heap_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$heap_{844,1;846,13}$)

limit == $\$heap_{844,1;846,13}$.LIMIT

minof(**int const**) $\leq$ limit

limit $\leq$ **maxof**(**int const**)

count == (**int**)0

minof(**int**) $\leq$ count

count $\leq$ **maxof**(**int**)

$\$heap_{844,1;851,5}$ ==
$\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r $\rightarrow$ writes_851_5)

$\$heap_{loopstart_853,5}$ == $\$heap_{844,1;851,5}$.**_replace**(prang $\rightarrow$
writes_854_12).**_replace**(_ecv_files $\rightarrow$ writes_854_12)

#writes_854_12 == #$\$heap_{844,1;851,5}$._ecv_files

minof(**int**) $\leq$ $count_{loopstart_853,5}$

$count_{loopstart_853,5}$ $\leq$ **maxof**(**int**)

$\$heap_{loopstart_853,5}$.prang.invariant1(**heapIs** $\$heap_{loopstart_853,5}$)

$count_{loopstart_853,5}$ < limit

0 $\leq$ (**asType**<**integer const**>(limit) $-$
asType<**integer**>($count_{loopstart_853,5}$))

(**asType**<**integer const**>(limit) $-$ **asType**<**integer**>($count_{loopstart_853,5}$))
$\leq$ (**asType**<**integer const**>(limit) $-$ **asType**<**integer**>(count))

$\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r
$\rightarrow$ **operator***(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 $\rightarrow$
writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 $\rightarrow$
writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 $\rightarrow$ writes_858_31))

$\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r → writes_858_9)

asType<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)

asType<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)

operator*(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs** $\$heap_{858,16}$)

Proof:

[Take given term]

[2.0] $\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang)

[Take given term]

[3.0] $\$heap_{844,1;846,13}$ == $\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[from term 2.0, $\$heap_{844,1;846,13,m1}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang)]*

[3.1] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[simplify]*

[3.2] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**((&$heap.prang).$r → writes_846_5)

→ *[attribute value is known from postcondition]*

[3.3] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(&$heap.prang → writes_846_5)

→ *[replacing contents of address-of object is same as replacing object]*

[3.4] $\$heap_{844,1;846,13}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)

[Take given term]

[10.0] $\$heap_{844,1;846,13}$.LIMIT == limit

→ *[from term 3.4, $\$heap_{844,1;846,13}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[10.1] $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).LIMIT == limit

→ *[const member of object with modified fields]*

[10.3] $\$heap_{funcstart_844,1}$.LIMIT == limit

→ *[const static or extern object]*

[10.4] $\$heap_{init}$.LIMIT == limit

→ *[expand definition of constant 'LIMIT' at prang.cpp (12,18)]*

[10.5] (**int**)80 == limit

→ *[simplify]*

[10.6] 80 == limit

[Take given term]

[11.0] (**int**)0 == count

→ *[simplify]*

[11.1] 0 == count

[Take given term]

[24.0] (**asType<integer const>**(limit) − **asType<integer>**($\text{count}_{loopstart_853,5}$)) ≤ (**asType<integer const>**(limit) − **asType<integer>**(count))

→ *[from term 10.6, limit is equal to 80]*

[24.1] (**asType<integer const>**(80) − **asType<integer>**($\text{count}_{loopstart_853,5}$)) ≤ (**asType<integer const>**(limit) − **asType<integer>**(count))

→ *[simplify]*

[24.4] (80 + −$\text{count}_{loopstart_853,5}$) ≤ (**asType<integer const>**(limit) − **asType<integer>**(count))

→ *[from term 10.6, limit is equal to 80]*

[24.5] (80 + −$\text{count}_{loopstart_853,5}$) ≤ (**asType<integer const>**(80) − **asType<integer>**(count))

→ *[simplify]*

[24.6] (80 + −$\text{count}_{loopstart_853,5}$) ≤ (80 − **asType<integer>**(count))

→ *[from term 11.1, count is equal to 0]*

[24.7] (80 + −$\text{count}_{loopstart_853,5}$) ≤ (80 − **asType<integer>**(0))

→ *[simplify]*

[24.20] -1 < $\text{count}_{loopstart_853,5}$

[Take goal term]

[1.0] **minof**(**int**) ≤ ++$\text{count}_{loopstart_853,5}$

→ *[simplify]*

[1.6] -32770 < $\text{count}_{loopstart_853,5}$

→ *[from term 24.20, literala < $\text{count}_{loopstart_853,5}$ is true whenever (-1 + literala) < -1]*

Proof of rule precondition:

[1.6.0] (-32770 + -1) < -1

→ *[simplify]*

[1.6.2] **true**

[1.7] **true**

Proof of verification condition: Arithmetic result of operator '++' is within limit of type 'int'

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (126,9)

Condition defined at:

To prove: $++\text{count}_{loopstart_853,5} \leq$ **maxof**(**int**)

Given:

$\$\text{heap}_{init}$.LIMIT == (**int**)80

$\$\text{heap}_{init}$.**class** WHPrang ∈ M1 == **asType**<**short int**>((**int**)30269)

$\$\text{heap}_{init}$.**class** WHPrang ∈ r1 == **asType**<**short int**>((**int**)171)

$\$\text{heap}_{init}$.**class** WHPrang ∈ a1 == **asType**<**short int**>((**int**)177)

$\$\text{heap}_{init}$.**class** WHPrang ∈ b1 == **asType**<**short int**>((**int**)2)

$\$\text{heap}_{init}$.**class** WHPrang ∈ M2 == **asType**<**short int**>((**int**)30307)

$\$\text{heap}_{init}$.**class** WHPrang ∈ r2 == **asType**<**short int**>((**int**)172)

$\$\text{heap}_{init}$.**class** WHPrang ∈ a2 == **asType**<**short int**>((**int**)176)

$\$\text{heap}_{init}$.**class** WHPrang ∈ b2 == **asType**<**short int**>((**int**)35)

$\$\text{heap}_{init}$.**class** WHPrang ∈ M3 == **asType**<**short int**>((**int**)30323)

$\$\text{heap}_{init}$.**class** WHPrang ∈ r3 == **asType**<**short int**>((**int**)170)

$\$\text{heap}_{init}$.**class** WHPrang ∈ a3 == **asType**<**short int**>((**int**)178)

$\$\text{heap}_{init}$.**class** WHPrang ∈ b3 == **asType**<**short int**>((**int**)63)

$\$\text{heap}_{844,1;846,13,m1}$ == $\$\text{heap}_{funcstart_844,1}$.**_alloc**(prang → prang)

$\$\text{heap}_{844,1;846,13}$ ==
$\$\text{heap}_{844,1;846,13,m1}$.**_replace**((&$\$\text{heap}_{844,1;846,13,m1}$.prang).$r → writes_846_5)

operator*(**heapIs** $\$\text{heap}_{844,1;846,13}$,
&$\$\text{heap}_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $\$\text{heap}_{844,1;846,13}$)

limit == $\$\text{heap}_{844,1;846,13}$.LIMIT

minof(**int const**) ≤ limit

limit ≤ **maxof**(**int const**)

count == (**int**)0

minof(**int**) $\leq$ count

count $\leq$ **maxof**(**int**)

$\$heap_{844,1;851,5}$ ==
$\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r $\rightarrow$ writes_851_5)

$\$heap_{loopstart_853,5}$ == $\$heap_{844,1;851,5}$.**_replace**(prang $\rightarrow$
writes_854_12).**_replace**(_ecv_files $\rightarrow$ writes_854_12)

#writes_854_12 == #$\$heap_{844,1;851,5}$._ecv_files

minof(**int**) $\leq$ $count_{loopstart_853,5}$

$count_{loopstart_853,5}$ $\leq$ **maxof**(**int**)

$\$heap_{loopstart_853,5}$.prang.invariant1(**heapIs** $\$heap_{loopstart_853,5}$)

$count_{loopstart_853,5}$ < limit

0 $\leq$ (**asType**<**integer const**>(limit) $-$
asType<**integer**>($count_{loopstart_853,5}$))

(**asType**<**integer const**>(limit) $-$ **asType**<**integer**>($count_{loopstart_853,5}$))
$\leq$ (**asType**<**integer const**>(limit) $-$ **asType**<**integer**>(count))

$\$heap_{858,16}$ == $\$heap_{loopstart_853,5}$.**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r
$\rightarrow$ **operator***(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p1 $\rightarrow$
writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p2 $\rightarrow$
writes_858_31)).**_replace**((&$\$heap_{loopstart_853,5}$.prang).$r $\rightarrow$
operator*(**heapIs** $\$heap_{loopstart_853,5}$,
&$\$heap_{loopstart_853,5}$.prang).**_replace**(p3 $\rightarrow$ writes_858_31))

$\$heap_{loopend}$ == $\$heap_{858,16}$.**_replace**((&$\$heap_{858,16}$._ecv_files[1]).$r $\rightarrow$
writes_858_9)

asType<**real**>((**double**)0.0) < **asType**<**real**>($result_858_31)

asType<**real**>($result_858_31) < **asType**<**real**>((**double**)1.0)

operator*(**heapIs** $\$heap_{858,16}$, &$\$heap_{loopstart_853,5}$.prang).invariant1(**heapIs**
$\$heap_{858,16}$)

Proof:

[Take given term]

[2.0] $\$heap_{844,1;846,13,m1}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)

[Take given term]

[3.0] $\$heap_{844,1;846,13}$ ==
$\$heap_{844,1;846,13,m1}$.**_replace**((&$\$heap_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

→ *[from term 2.0, $heap$_{844,1;846,13,m1}$ is equal to $heap$_{funcstart_844,1}$.__**alloc**(prang → prang)]*

[3.1] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**((&$heap$_{844,1;846,13,m1}$.prang).$r → writes_846_5)

→ *[simplify]*

[3.2] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**((&$heap.prang).$r → writes_846_5)

→ *[attribute value is known from postcondition]*

[3.3] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(&$heap.prang → writes_846_5)

→ *[replacing contents of address-of object is same as replacing object]*

[3.4] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5)

[Take given term]

[10.0] $heap$_{844,1;846,13}$.LIMIT == limit

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5)]*

[10.1] $heap$_{funcstart_844,1}$.__**alloc**(prang → prang).__**replace**(prang → writes_846_5).LIMIT == limit

→ *[const member of object with modified fields]*

[10.3] $heap$_{funcstart_844,1}$.LIMIT == limit

→ *[const static or extern object]*

[10.4] $heap$_{init}$.LIMIT == limit

→ *[expand definition of constant 'LIMIT' at prang.cpp (12,18)]*

[10.5] (**int**)80 == limit

→ *[simplify]*

[10.6] 80 == limit

[Take given term]

[23.0] $count_{loopstart_853,5}$ < limit

→ *[from term 10.6, limit is equal to 80]*

[23.1] $count_{loopstart_853,5}$ < 80

→ *[simplify]*

[23.4] -80 < $-count_{loopstart_853,5}$

[Take goal term]

[1.0] ++count$_{loopstart_853,5}$ $\leq$ **maxof**(**int**)

$\rightarrow$ *[simplify]*

[1.9] -32767 $<$ $-$count$_{loopstart_853,5}$

$\rightarrow$ *[from term 23.4, literala $<$ $-$count$_{loopstart_853,5}$ is true whenever (-1 + literala) $<$ -80]*

Proof of rule precondition:

[1.9.0] (-32767 + -1) $<$ -80

$\rightarrow$ *[simplify]*

[1.9.2] **true**

[1.10] **true**

Proof of verification condition: Loop initialisation establishes loop invariant

Condition generated at: C:\Escher\Customers\prang-cpp\prang.cpp (120,5)

Condition defined at: C:\Escher\Customers\prang-cpp\prang.cpp (122,16)

To prove: $heap$_{844,1;851,5}$.prang.invariant1(**heapIs** $heap$_{844,1;851,5}$)

Given:

$heap$_{init}$.LIMIT == (**int**)80

$heap$_{init}$.**class** WHPrang $\in$ M1 == **asType**<**short int**>((**int**)30269)

$heap$_{init}$.**class** WHPrang $\in$ r1 == **asType**<**short int**>((**int**)171)

$heap$_{init}$.**class** WHPrang $\in$ a1 == **asType**<**short int**>((**int**)177)

$heap$_{init}$.**class** WHPrang $\in$ b1 == **asType**<**short int**>((**int**)2)

$heap$_{init}$.**class** WHPrang $\in$ M2 == **asType**<**short int**>((**int**)30307)

$heap$_{init}$.**class** WHPrang $\in$ r2 == **asType**<**short int**>((**int**)172)

$heap$_{init}$.**class** WHPrang $\in$ a2 == **asType**<**short int**>((**int**)176)

$heap$_{init}$.**class** WHPrang $\in$ b2 == **asType**<**short int**>((**int**)35)

$heap$_{init}$.**class** WHPrang $\in$ M3 == **asType**<**short int**>((**int**)30323)

$heap$_{init}$.**class** WHPrang $\in$ r3 == **asType**<**short int**>((**int**)170)

$heap$_{init}$.**class** WHPrang $\in$ a3 == **asType**<**short int**>((**int**)178)

$heap$_{init}$.**class** WHPrang $\in$ b3 == **asType**<**short int**>((**int**)63)

$heap$_{844,1;846,13,m1}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)

$heap$_{844,1;846,13}$ ==
$heap$_{844,1;846,13,m1}$.**_replace**((&$heap$_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

operator*(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $heap$_{844,1;846,13}$)

limit == $heap$_{844,1;846,13}$.LIMIT

minof(**int const**) $\leq$ limit

limit $\leq$ **maxof**(**int const**)

count == (**int**)0

minof(**int**) $\leq$ count

count $\leq$ **maxof**(**int**)

$heap$_{844,1;851,5}$ ==
$heap$_{844,1;846,13}$.**_replace**((&$heap$_{844,1;846,13}$._ecv_files[1]).$r $\rightarrow$ writes_851_5)

Proof:

[Take given term]

[2.0] $heap$_{844,1;846,13,m1}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)

[Take given term]

[3.0] $heap$_{844,1;846,13}$ ==
$heap$_{844,1;846,13,m1}$.**_replace**((&$heap$_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

$\rightarrow$ *[from term 2.0, $heap$_{844,1;846,13,m1}$ is equal to
$heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$ prang)]*

[3.1] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$
prang).**_replace**((&$heap$_{844,1;846,13,m1}$.prang).$r $\rightarrow$ writes_846_5)

$\rightarrow$ *[simplify]*

[3.2] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$
prang).**_replace**((&$heap.prang).$r $\rightarrow$ writes_846_5)

$\rightarrow$ *[attribute value is known from postcondition]*

[3.3] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$
prang).**_replace**(&$heap.prang $\rightarrow$ writes_846_5)

$\rightarrow$ *[replacing contents of address-of object is same as replacing object]*

[3.4] $heap$_{844,1;846,13}$ == $heap$_{funcstart_844,1}$.**_alloc**(prang $\rightarrow$
prang).**_replace**(prang $\rightarrow$ writes_846_5)

[Take given term]

[4.0] **operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13,m1}$.prang).invariant1(**heapIs** $heap$_{844,1;846,13}$)

$\rightarrow$ *[Dereference address-of object]*

[4.1] $heap$_{844,1;846,13}$.prang.invariant1(**heapIs** $heap$_{844,1;846,13}$)

$\rightarrow$ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp*

(28,9)]

[4.2] (((((0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p1) < **asType**<**integer**>($heap$_{844,1;846,13}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.3] (((((0 < **asType**<**integer**>($heap$_{844,1;846,13}$.prang.p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p1) < **asType**<**integer**>($heap$_{844,1;846,13}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.4] (((((0 < $heap$_{844,1;846,13}$.prang.p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p1) < **asType**<**integer**>($heap$_{844,1;846,13}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.5] (((((0 < $heap$_{844,1;846,13}$.prang.p1) && (**asType**<**integer**>($heap$_{844,1;846,13}$.prang.p1) < **asType**<**integer**>($heap$_{844,1;846,13}$.M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs**

$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) <
asType<integer>($heap$_{844,1;846,13}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) <
asType<integer>($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.6] (((((0 < $heap$_{844,1;846,13}$.prang.p1) && ($heap$_{844,1;846,13}$.prang.p1 <
asType<integer>($heap$_{844,1;846,13}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) <
asType<integer>($heap$_{844,1;846,13}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) <
asType<integer>($heap$_{844,1;846,13}$.M3))

→ *[const static or extern object]*

[4.7] (((((0 < $heap$_{844,1;846,13}$.prang.p1) && ($heap$_{844,1;846,13}$.prang.p1 <
asType<integer>($heap$_{init}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) <
asType<integer>($heap$_{844,1;846,13}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) <
asType<integer>($heap$_{844,1;846,13}$.M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[4.8] (((((0 < $heap$_{844,1;846,13}$.prang.p1) && ($heap$_{844,1;846,13}$.prang.p1 <
asType<integer>(**asType<short int>**((**int**)30269)))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) <
asType<integer>($heap$_{844,1;846,13}$.M2))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{844,1;846,13}$,
&$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) <
asType<integer>($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.15] (((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 <
$heap$_{844,1;846,13}$.prang.p1)) && (0 < **asType<integer>**(**operator***(**heapIs**

$heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.16] (((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1)) && (0 < **asType**<**integer**>($heap$_{844,1;846,13}$.prang.p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.19] ((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.20] ((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && (**asType**<**integer**>($heap$_{844,1;846,13}$.prang.p2) < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType**<**integer**>($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.21] ((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && ($heap$_{844,1;846,13}$.prang.p2 < **asType**<**integer**>($heap$_{844,1;846,13}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) <

asType<integer>($heap$_{844,1;846,13}$.M3))

→ *[const static or extern object]*

[4.22] ((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && ($heap$_{844,1;846,13}$.prang.p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[4.23] ((((-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && ($heap$_{844,1;846,13}$.prang.p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.31] (((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.32] (((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2)) && (0 < **asType<integer>**($heap$_{844,1;846,13}$.prang.p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.35] ((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{844,1;846,13}$, &$heap$_{844,1;846,13}$.prang).p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[Dereference address-of object]*

[4.36] ((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)) &&

(**asType<integer>**($heap$_{844,1;846,13}$.prang.p3) < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[simplify]*

[4.37] ((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)) && ($heap$_{844,1;846,13}$.prang.p3 < **asType<integer>**($heap$_{844,1;846,13}$.M3))

→ *[const static or extern object]*

[4.38] ((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)) && ($heap$_{844,1;846,13}$.prang.p3 < **asType<integer>**($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[4.39] ((-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)) && ($heap$_{844,1;846,13}$.prang.p3 < **asType<integer>**(**asType<short int>**((**int**)30323)))

→ *[simplify]*

[4.47] (-30323 < −$heap$_{844,1;846,13}$.prang.p3) ∧ (-30307 < −$heap$_{844,1;846,13}$.prang.p2) ∧ (-30269 < −$heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p1) ∧ (0 < $heap$_{844,1;846,13}$.prang.p2) ∧ (0 < $heap$_{844,1;846,13}$.prang.p3)

→ *[separate conjunction and work on first sub-term]*

[4.48] -30323 < −$heap$_{844,1;846,13}$.prang.p3

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[4.49] -30323 < −$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p3

→ *[simplify]*

[4.50] -30323 < −writes_846_5.p3

[Work on sub-term 2 of conjunction in term 4.47]

[5.0] -30307 < −$heap$_{844,1;846,13}$.prang.p2

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[5.1] -30307 < −$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p2

→ *[simplify]*

[5.2] -30307 < −writes_846_5.p2

[Work on sub-term 3 of conjunction in term 4.47]

[6.0] -30269 < −$heap$_{844,1;846,13}$.prang.p1

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.*_**alloc***(prang → prang).*_**replace***(prang → writes_846_5)]*

[6.1] -30269 < −$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p1

→ *[simplify]*

[6.2] -30269 < −writes_846_5.p1

[Work on sub-term 4 of conjunction in term 4.47]

[7.0] 0 < $heap$_{844,1;846,13}$.prang.p1

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.*_**alloc***(prang → prang).*_**replace***(prang → writes_846_5)]*

[7.1] 0 < $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p1

→ *[simplify]*

[7.2] 0 < writes_846_5.p1

[Work on sub-term 5 of conjunction in term 4.47]

[8.0] 0 < $heap$_{844,1;846,13}$.prang.p2

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.*_**alloc***(prang → prang).*_**replace***(prang → writes_846_5)]*

[8.1] 0 < $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p2

→ *[simplify]*

[8.2] 0 < writes_846_5.p2

[Work on sub-term 6 of conjunction in term 4.47]

[9.0] 0 < $heap$_{844,1;846,13}$.prang.p3

→ *[from term 3.4, $heap$_{844,1;846,13}$ is equal to $heap$_{funcstart_844,1}$.*_**alloc***(prang → prang).*_**replace***(prang → writes_846_5)]*

[9.1] 0 < $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).prang.p3

→ *[simplify]*

[9.2] 0 < writes_846_5.p3

[Take given term]

[12.0] $heap$_{844,1;851,5}$ ==

$\$heap_{844,1;846,13}$.**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r → writes_851_5)

→ *[from term 3.4, $\$heap_{844,1;846,13}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5)]*

[12.1] $\$heap_{844,1;851,5}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$\$heap_{844,1;846,13}$._ecv_files[1]).$r → writes_851_5)

→ *[simplify]*

[12.2] $\$heap_{844,1;851,5}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]).$r → writes_851_5)

→ *[attribute value is known from postcondition]*

[12.3] $\$heap_{844,1;851,5}$ == $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5)

[Take goal term]

[1.0] $\$heap_{844,1;851,5}$.prang.invariant1(**heapIs** $\$heap_{844,1;851,5}$)

→ *[from term 12.3, $\$heap_{844,1;851,5}$ is equal to $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5)]*

[1.1] $\$heap_{844,1;851,5}$.prang.invariant1(**heapIs** $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5))

→ *[expand definition of function 'invariant1' in class 'WHPrang' at prang.cpp (28,9)]*

[1.2] (((((0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$\$heap_{844,1;851,5}$.prang).p1)) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$\$heap_{844,1;851,5}$.prang).p1) < **asType<integer>**($\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$\$heap_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$\$heap_{844,1;851,5}$.prang).p2) < **asType<integer>**($\$heap_{funcstart_844,1}$.**_alloc**(prang →

prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.3] (((((0 < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p1)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p1) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.6] (((((0 < writes_846_5.p1) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p1) <

asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[from term 7.2, literala < writes_846_5.p1 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.6.0] (-1 + 0) < 0

→ *[simplify]*

[1.6.2] **true**

[1.7] ((((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p1) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs**

$\$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p3) < **asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.8] ((((**true** && (**asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p1) < **asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p2) < **asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p3) < **asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.11] ((((**true** && (writes_846_5.p1 < **asType<integer>**($$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M1))) && (0 < **asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$$heap_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $$heap_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),

&$heap$_{844,1;851,5}$.prang).p2) <
asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) →
writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p3) <
asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) →
writes_851_5).M3))

→ *[const member of object with modified fields]*

[1.14] ((((**true** && (writes_846_5.p1 <
asType<integer>($heap$_{funcstart_844,1}$.M1))) && (0 <
asType<integer>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] →
writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) &&
(**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] →
writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) <
asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) →
writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p3) <
asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang →
prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) →
writes_851_5).M3))

→ *[const static or extern object]*

[1.15] ((((**true** && (writes_846_5.p1 < **asType<integer>**($heap$_{init}$.M1)))
&& (0 < **asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs**
$heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →
writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5),
&$heap$_{844,1;851,5}$.prang).p2) <
asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang →

prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[expand definition of constant 'M1' at prang.cpp (32,24)]*

[1.16] ((((**true** && (writes_846_5.p1 < **asType**<**integer**>(**asType**<**short int**>((**int**)30269)))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.22] ((((**true** && (-30269 < −writes_846_5.p1)) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →

writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[from term 6.2, literala < −writes_846_5.p1 is true whenever (-1 + literala) < -30269]*

Proof of rule precondition:

[1.22.0] (-30269 + -1) < -30269

→ *[simplify]*

[1.22.2] **true**

[1.23] ((((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.24] (((**true** && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang →

prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.25] (((**true** && (0 < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p2))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.28] (((**true** && (0 < writes_846_5.p2)) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) <

asType<integer>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[from term 8.2, literala < writes_846_5.p2 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.28.0] (-1 + 0) < 0

→ *[simplify]*

[1.28.2] **true**

[1.29] (((**true** && **true**) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.30] ((**true** && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p2) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.31] ((**true** && (**asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p2) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.34] ((**true** && (writes_846_5.p2 < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[const member of object with modified fields]*

[1.37] ((**true** && (writes_846_5.p2 < **asType**<**integer**>($heap$_{funcstart_844,1}$.M2))) && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[const static or extern object]*

[1.38] ((**true** && (writes_846_5.p2 < **asType<integer>**($heap$_{init}$.M2))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[expand definition of constant 'M2' at prang.cpp (37,24)]*

[1.39] ((**true** && (writes_846_5.p2 < **asType<integer>**(**asType<short int>**((**int**)30307)))) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.45] ((**true** && (-30307 < −writes_846_5.p2)) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType<integer>**($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[from term 5.2, literala < −writes_846_5.p2 is true whenever (-1 + literala) < -30307]*

Proof of rule precondition:

[1.45.0] (-30307 + -1) < -30307

→ *[simplify]*

[1.45.2] **true**

[1.46] ((**true** && **true**) && (0 < **asType<integer>**(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang →

writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.47] (**true** && (0 < **asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.48] (**true** && (0 < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p3))) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.51] (**true** && (0 < writes_846_5.p3)) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[from term 9.2, literala < writes_846_5.p3 is true whenever (-1 + literala) < 0]*

Proof of rule precondition:

[1.51.0] (-1 + 0) < 0

→ *[simplify]*

[1.51.2] **true**

[1.52] (**true** && **true**) && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.53] **true** && (**asType**<**integer**>(**operator***(**heapIs** $heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**(&$heap._ecv_files[1] → writes_851_5), &$heap$_{844,1;851,5}$.prang).p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[Dereference address-of object]*

[1.54] **true** && (**asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).prang.p3) < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[simplify]*

[1.57] **true** && (writes_846_5.p3 < **asType**<**integer**>($heap$_{funcstart_844,1}$.**_alloc**(prang → prang).**_replace**(prang → writes_846_5).**_replace**((&$heap._ecv_files[1]) → writes_851_5).M3))

→ *[const member of object with modified fields]*

[1.60] **true** && (writes_846_5.p3 < **asType**<**integer**>($heap$_{funcstart_844,1}$.M3))

→ *[const static or extern object]*

[1.61] **true** && (writes_846_5.p3 < **asType**<**integer**>($heap$_{init}$.M3))

→ *[expand definition of constant 'M3' at prang.cpp (42,24)]*

[1.62] **true** && (writes_846_5.p3 < **asType**<**integer**>(**asType**<**short int**>((**int**)30323)))

→ *[simplify]*

[1.68] **true** && (-30323 < −writes_846_5.p3)

→ *[from term 4.50, literala < −writes_846_5.p3 is true whenever (-1 + literala) < -30323]*

Proof of rule precondition:

[1.68.0] (-30323 + -1) < -30323

→ *[simplify]*

[1.68.2] **true**

[1.69] **true** && **true**

→ *[simplify]*

[1.70] **true**

End of proofs for file C:\Escher\Customers\prang-cpp\prang.cpp