

- $(int * (int \rightarrow bool) * (int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow bool)$
- $(int * bool * (int * (int \rightarrow int) * int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow (bool \rightarrow int))$
- $int * (bool \rightarrow (bool \rightarrow bool)) * (bool \rightarrow bool) \rightarrow (int * (bool \rightarrow (int \rightarrow bool))) \rightarrow (bool \rightarrow int)$

let
 $F = \text{proc}(int\ x, (int \rightarrow bool)\ y, (int \rightarrow (bool \rightarrow int))\ z)$
 proc(int p)
 if (y x)
 then $x(z\ x)\ \text{True}$, 3)
 else $x(x, p)$
 in
 F

- $(int * (int \rightarrow bool) * (int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow bool)$
- $(int * bool * (int * (int \rightarrow int) * int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow (bool \rightarrow int))$
- $int * (bool \rightarrow (bool \rightarrow bool)) * (bool \rightarrow bool) \rightarrow (int * (bool \rightarrow (int \rightarrow bool))) \rightarrow (bool \rightarrow int)$

let
 $f = \text{proc}(int\ x, bool\ y,$
 $int * (int \rightarrow int) * int \rightarrow (bool \rightarrow int)\ z)$
 $\text{proc}(int \rightarrow (bool \rightarrow int)\ a)$
 if y
 then $\text{proc}(bool\ b)$
 if b
 then x
 else 3
 else
 $(z\ 5\ \text{add1}\ 10)$

in
 f

- $(int * (int \rightarrow bool) * (int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow bool)$
- $(int * bool * (int * (int \rightarrow int) * int \rightarrow (bool \rightarrow int))) \rightarrow (int \rightarrow (bool \rightarrow int))$
- $int * (bool \rightarrow (bool \rightarrow bool)) * (bool \rightarrow bool) \rightarrow (int * (bool \rightarrow (int \rightarrow bool))) \rightarrow (bool \rightarrow int)$
 $\quad \quad \quad x \quad \quad \quad y \quad \quad \quad z \quad \quad \quad a \quad \quad \quad b$

let

$f = \text{proc } (int\ x, \text{ bool} \rightarrow \text{bool}\ y, \text{ bool} \rightarrow \text{bool}\ z)$

$\text{proc } (int\ a, \text{ bool} \rightarrow (int \rightarrow \text{bool})\ b)$

if and $(y\ \text{true}), (z\ \text{false})$

then $\text{proc } (bool\ c) + (x, a)$

else

$\text{proc } (bool\ c)$

if $(b\ \text{true})\ 5$

then 5

else $+ (x, a)$

in F

$((int \rightarrow (int \rightarrow int)) * (int \rightarrow ((int \rightarrow int) \rightarrow int)) \rightarrow (bool * (int \rightarrow int) * ((int \rightarrow int) \rightarrow int) \rightarrow (int \rightarrow int)))$
 $\quad \quad \quad x \quad \quad \quad y \quad \quad \quad a \quad \quad \quad b \quad \quad \quad c \quad \quad \quad e$

$\text{proc } (int \rightarrow (int \rightarrow int)\ x,$

$int \rightarrow (int \rightarrow int) \rightarrow int\ y)$

$\text{proc } (bool\ a,$

$int \rightarrow int\ b$

$(int \rightarrow int) \rightarrow int\ c)$

$\text{proc } (int\ e)$

if a , then

$+ ((x\ 5)\ 8),$

$+ (c\ \text{proc } (int\ j) * (j, 2))$

$* (7, e))$

else

$+ ((y\ 9)\ \text{proc } (int\ w) * (w, 8))$

$(b\ 8))$

$\frac{+}{x} \quad int \rightarrow int \rightarrow int$

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let g = proc (int x, int y, bool z, bool w)
  if < (x, y) then and(z, w)
  else w
f = proc (int * int * bool * bool → bool h,
  int → bool p, int m, int n, bool o)
  if (p m) then false
  else (h n m (p n) (p * (2, m)))
q = proc (int a)
  > (a, 4)
i = false

```

in
 (f g q 1 5 i) \leftrightarrow bool

$$t_g = (int * int * bool * bool) \rightarrow bool$$

$$t_x = int \quad t_y = int \quad t_z = bool \quad t_w = bool$$

$$\swarrow \begin{matrix} <(x, y) \\ int * int \rightarrow bool \end{matrix}$$

$$\searrow \begin{matrix} and(z, w) \\ bool * bool \rightarrow bool \end{matrix}$$

$$t_f = ((int * int * bool * bool \rightarrow bool) * (int \rightarrow bool) * int * int * bool) \rightarrow bool$$

$$\swarrow t_h = (int * int * bool * bool \rightarrow bool)$$

$$t_o = bool$$

$$\swarrow t_p = (int \rightarrow bool)$$

$$t_m = int$$

$$t_n = int$$

$$(p \ m)$$

$$t_p = t_m \rightarrow bool$$

$$t_p = int \rightarrow bool$$

$$(h \ n \ m \ (p \ n) \ (p \ * \ (2, \ m)))$$

$$t_h = t_p * t_m * bool * bool \rightarrow bool$$

$$\swarrow \begin{matrix} (p \ n) \\ t_p = t_n \rightarrow bool \\ int \end{matrix}$$

$$t_h = int * int * bool * bool \rightarrow bool$$

$$(p \ * \ (2, \ m))$$

$$int * int \rightarrow int$$

$$t_q = int \rightarrow bool$$

$$t_i = bool$$

$$\swarrow t_q = int$$

$$\swarrow \begin{matrix} <(q, 4) \\ int * int \rightarrow bool \end{matrix}$$

$$\begin{matrix} \text{proc} \\ \downarrow \\ (f \ g \ q \ 1 \ 5 \ i) \end{matrix}$$

rotor
proc

$$t_f = t_g * t_q * int * int * t_i$$

$$t_f = ((int * int * bool * bool) \rightarrow bool) * (int \rightarrow bool) * int * int * bool \rightarrow bool$$

$$bool$$