Figure 1: timing-pattern

1

Figure 2: timing-n-polymorphic-universes param-1-n 0
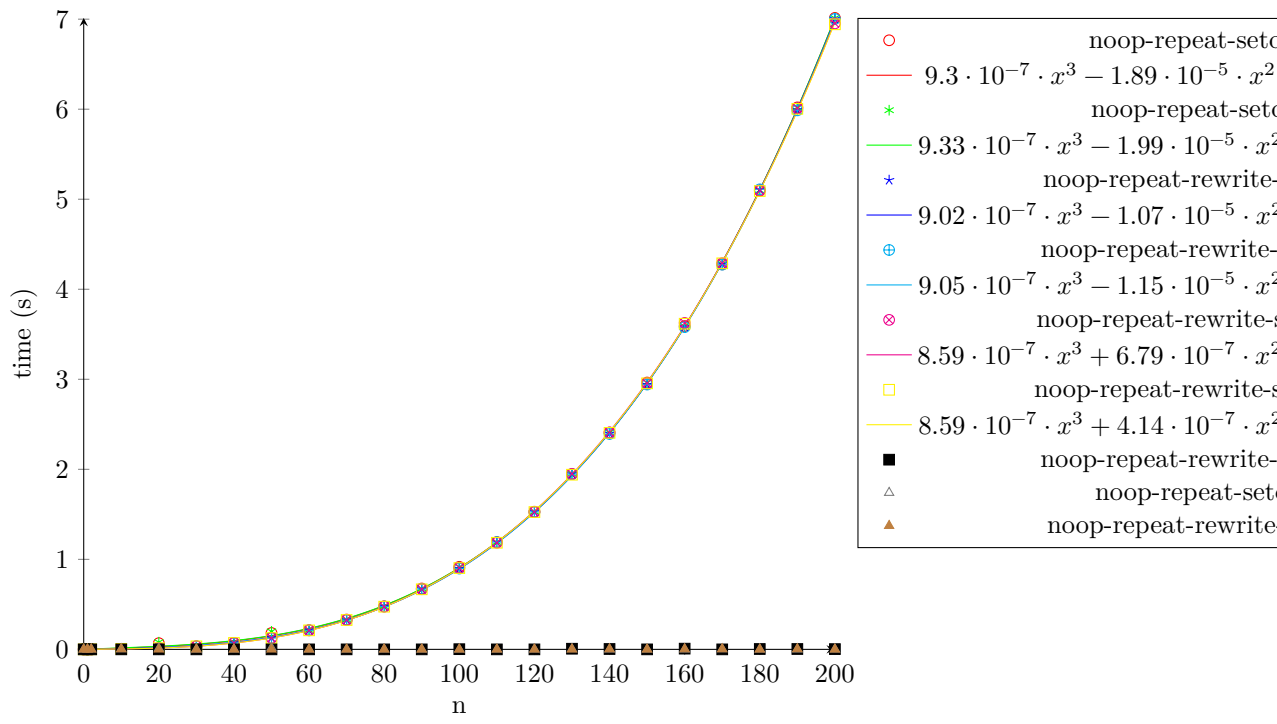
time (s)

100

80

60

40

20

0

0   50   100   150   200   250   300   350   400

n

Legend:

○ repeat-seto...
$2.01 \cdot 10^{-6} \cdot x^3 - 1.04 \cdot 10^{-...}$
∗ repeat-seto...
$2 \cdot 10^{-6} \cdot x^3 - 1.03 \cdot 10^{-4} \cdot ...$
∗ abstract+set...
$9.53 \cdot 10^{-7} \cdot x^3 - 1.84 \cdot 10^{-5} \cdot ...$
⊕ abstract+set...
$9.5 \cdot 10^{-7} \cdot x^3 - 1.71 \cdot 10^{-5} \cdot ...$
⊗ setoid-r...
$9.51 \cdot 10^{-7} \cdot x^3 - 3.53 \cdot 10^{-5} \cdot ...$
□ setoid-r...
$9.48 \cdot 10^{-7} \cdot x^3 - 3.42 \cdot 10^{-5} \cdot ...$
■ noop-try-set...
$9.52 \cdot 10^{-7} \cdot x^3 - 2.92 \cdot 10^{-5} \cdot ...$
△ noop-try-set...
$9.47 \cdot 10^{-7} \cdot x^3 - 2.73 \cdot 10^{-5} \cdot ...$
▲ noop-repeat-s...
$9.58 \cdot 10^{-7} \cdot x^3 - 4.06 \cdot 10^{-5} \cdot ...$
◇ noop-repeat-s...
$9.58 \cdot 10^{-7} \cdot x^3 - 4.03 \cdot 10^{-5} \cdot ...$
◆ close-abstract+...
$1.83 \cdot 10^{-5} \cdot x^2 + 2.9...$
⬠ close-abstract+...
$1.83 \cdot 10^{-5} \cdot x^2 + 2.9...$
⬠ noop-try-set...
— repeat-seto...
| noop-repeat-s...
● setoid-r...
● abstract+se...
○ close-abstract+...

Figure 3: timing-repeat-setoid-rewrite-under-binders

3

Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

4

Figure 5: timing-rewrite-strat-under-binders

abstract+rewrite!-
$2.57 \cdot 10^{-5} \cdot x^2 - 6.18 \cdot 10^{-4} \cdot$
abstract+rewrite!-u
$2.57 \cdot 10^{-5} \cdot x^2 - 6.27 \cdot 10^{-4} \cdot$
abstract+autorewrit
$2.55 \cdot 10^{-5} \cdot x^2 - 5.93 \cdot 10^{-4} \cdot$
abstract+autorewrit
$2.54 \cdot 10^{-5} \cdot x^2 - 5.95 \cdot 10^{-4} \cdot$
rewrite!-real
$1.7 \cdot 10^{-5} \cdot x^2 - 6.59 \cdot 10^{-4} \cdot$
rewrite!-user
$1.7 \cdot 10^{-5} \cdot x^2 - 6.67 \cdot 10^{-4} \cdot$
autorewrite-rea
$1.67 \cdot 10^{-5} \cdot x^2 - 6.34 \cdot 10^{-4} \cdot$
autorewrite-use
$1.67 \cdot 10^{-5} \cdot x^2 - 6.33 \cdot 10^{-4} \cdot$
close-abstract+rewrit
$8.74 \cdot 10^{-6} \cdot x^2 + 1.5 \cdot 10^{-5} \cdot$
close-abstract+rewrit
$8.73 \cdot 10^{-6} \cdot x^2 + 1.27 \cdot 10^{-5} \cdot$
close-abstract+autorew
$8.69 \cdot 10^{-6} \cdot x^2 + 1.64 \cdot 10^{-5} \cdot$
close-abstract+autorew
$8.69 \cdot 10^{-6} \cdot x^2 + 1.84 \cdot 10^{-5} \cdot$
abstract+autorewrit
autorewrite-sys
autorewrite-noop-u
$2.43 \cdot 10^{-5} \cdot x - 9.18$
autorewrite-noop-r
$2.43 \cdot 10^{-5} \cdot x - 9.18$
rewrite?-noop-us
$2.38 \cdot 10^{-5} \cdot x - 8.47$
rewrite?-noop-re
$2.38 \cdot 10^{-5} \cdot x - 8.37$
abstract+rewrite!-
rewrite!-sys
close-abstract+rewrit
rewrite?-noop-sy
close-abstract+autorew
autorewrite-noop-

Figure 6: timing-rewrite-repeated-app-autorewrite

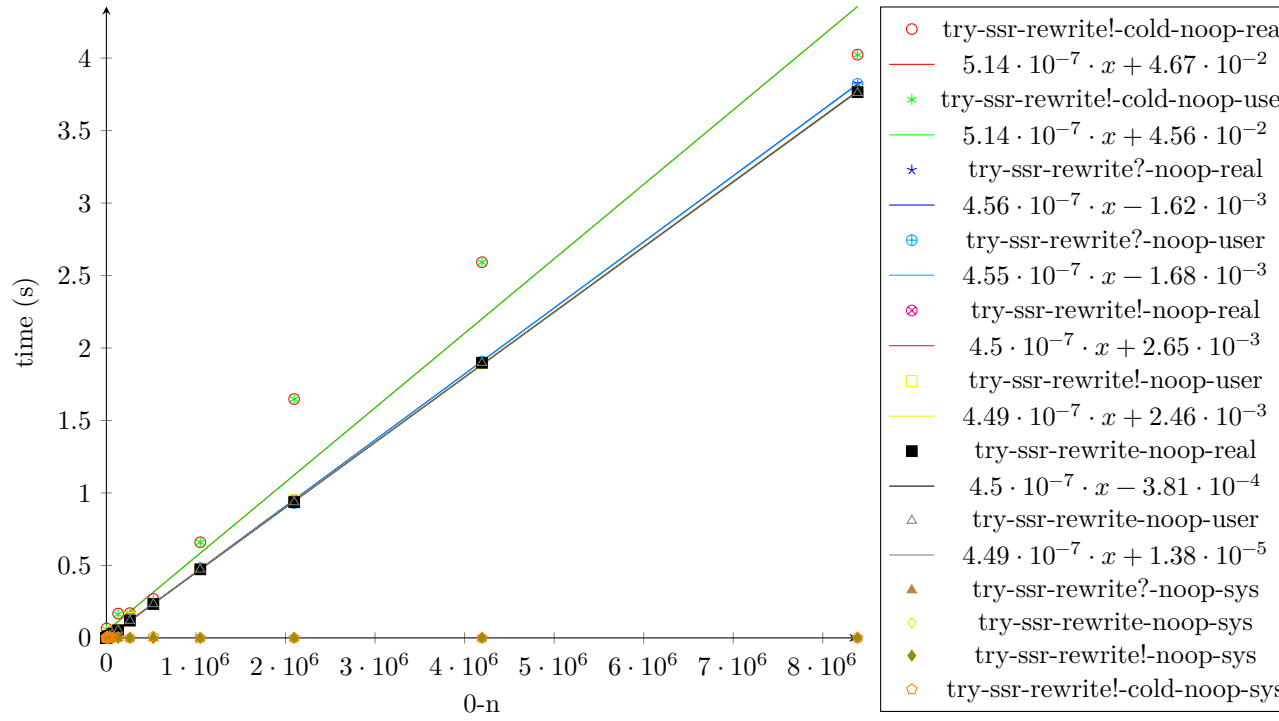Figure 7: timing-rewrite-repeated-app-autorewrite-noop
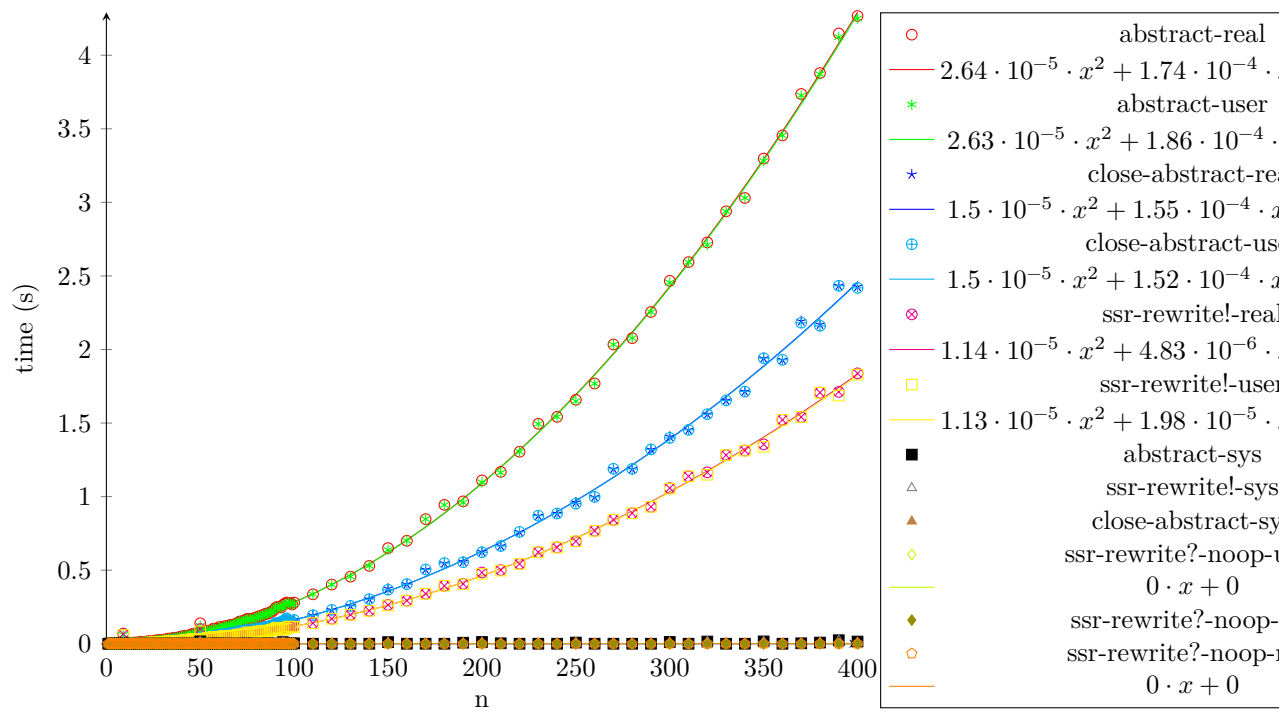
Figure 8: timing-rewrite-repeated-app-ssrrewrite

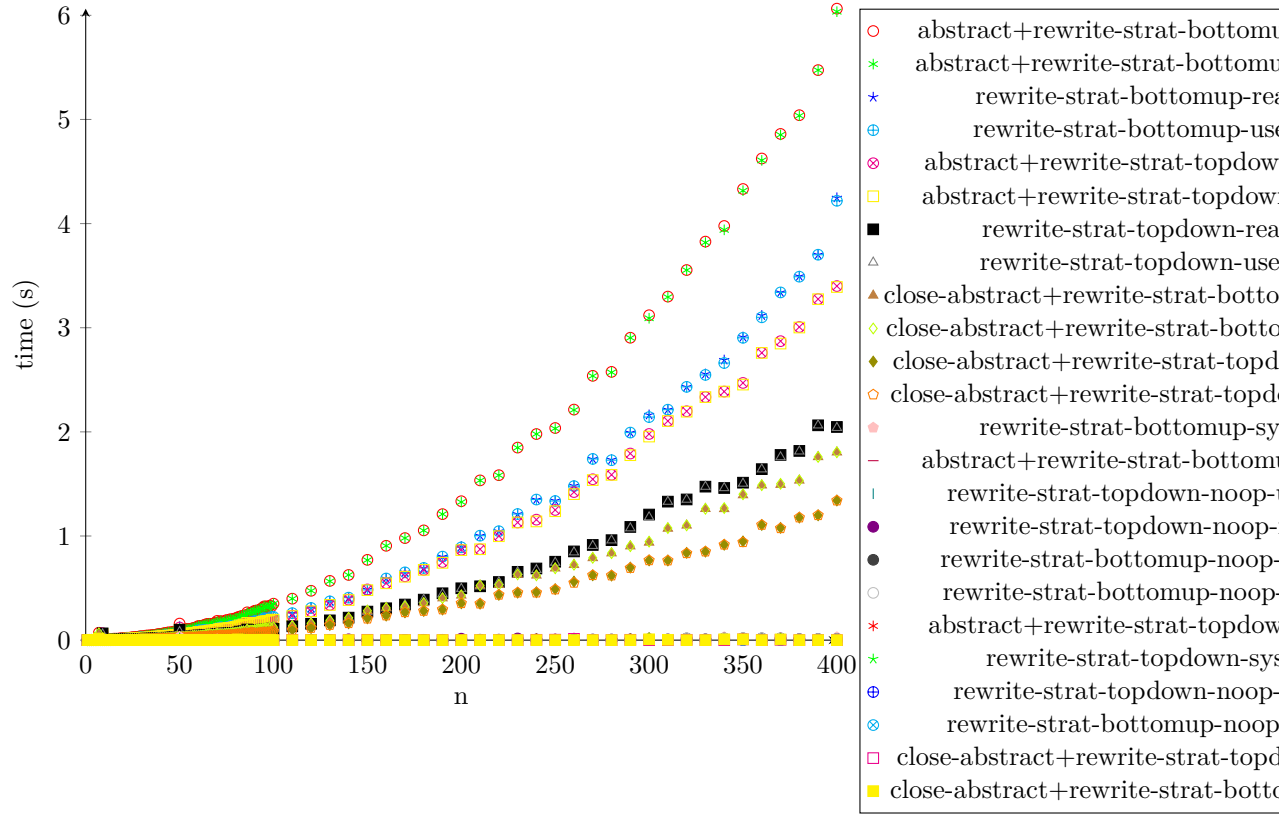Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

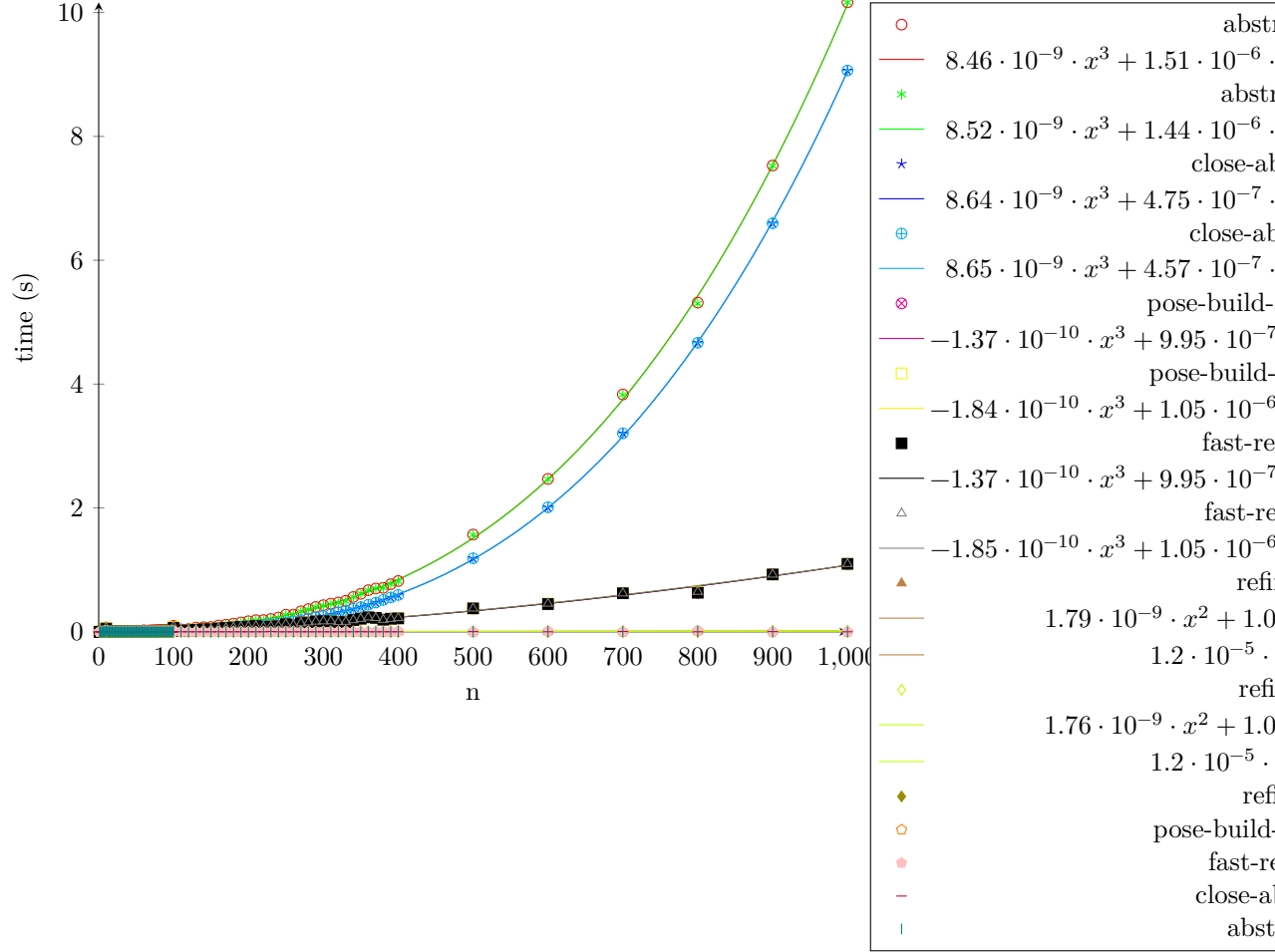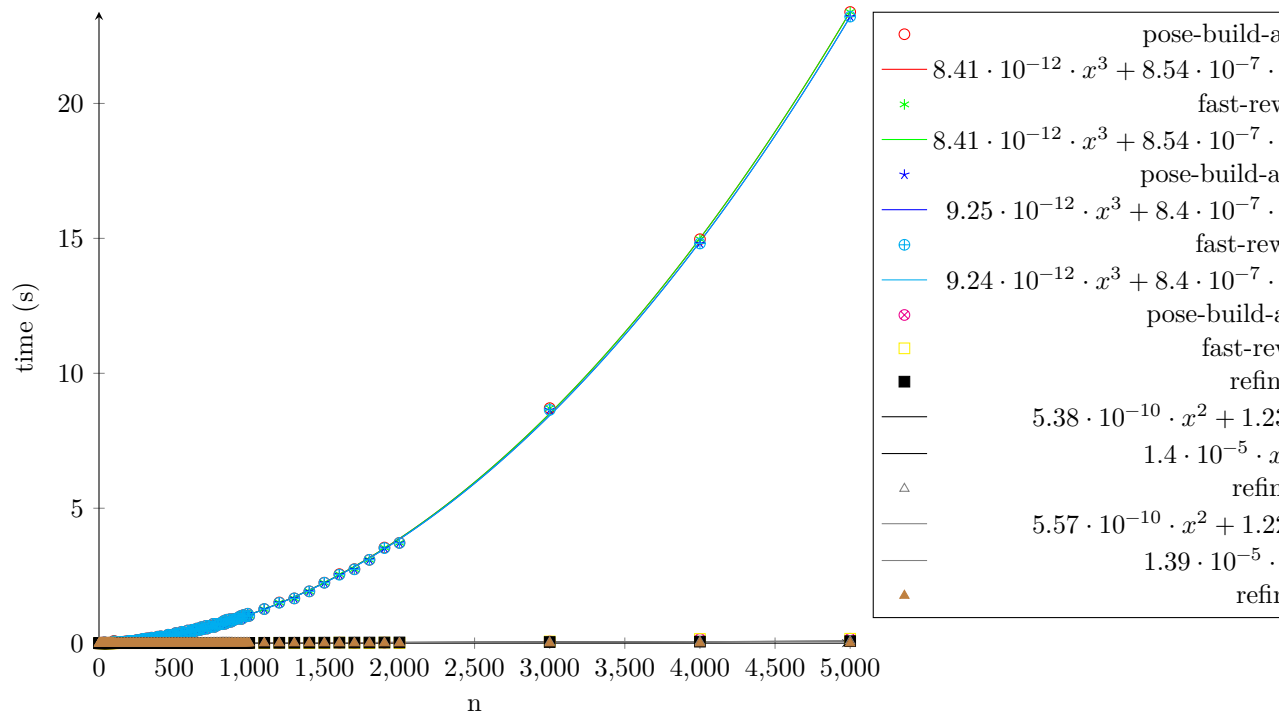Figure 10: timing-rewrite-repeated-app-rewrite-strat

The legend of the figure contains the following entries:

- abstract+rewrite-strat-bottomu...
- abstract+rewrite-strat-bottomu...
- rewrite-strat-bottomup-rea...
- rewrite-strat-bottomup-use...
- abstract+rewrite-strat-topdow...
- abstract+rewrite-strat-topdow...
- rewrite-strat-topdown-rea...
- rewrite-strat-topdown-use...
- close-abstract+rewrite-strat-botto...
- close-abstract+rewrite-strat-botto...
- close-abstract+rewrite-strat-topd...
- close-abstract+rewrite-strat-topd...
- rewrite-strat-bottomup-sy...
- abstract+rewrite-strat-bottomu...
- rewrite-strat-topdown-noop-u...
- rewrite-strat-topdown-noop-...
- rewrite-strat-bottomup-noop-...
- rewrite-strat-bottomup-noop-...
- abstract+rewrite-strat-topdow...
- rewrite-strat-topdown-sys...
- rewrite-strat-topdown-noop-...
- rewrite-strat-bottomup-noop...
- close-abstract+rewrite-strat-topd...
- close-abstract+rewrite-strat-botto...

10

Figure 11: timing-rewrite-repeated-app-fast-rewrite

Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
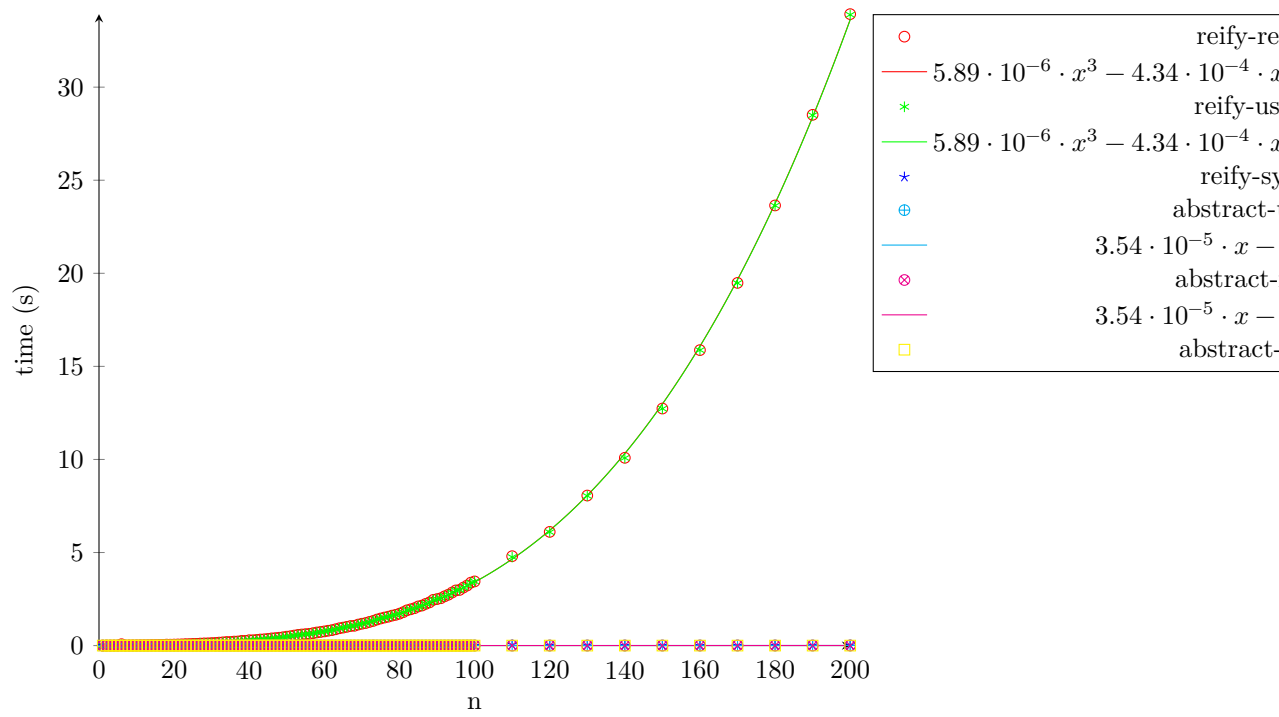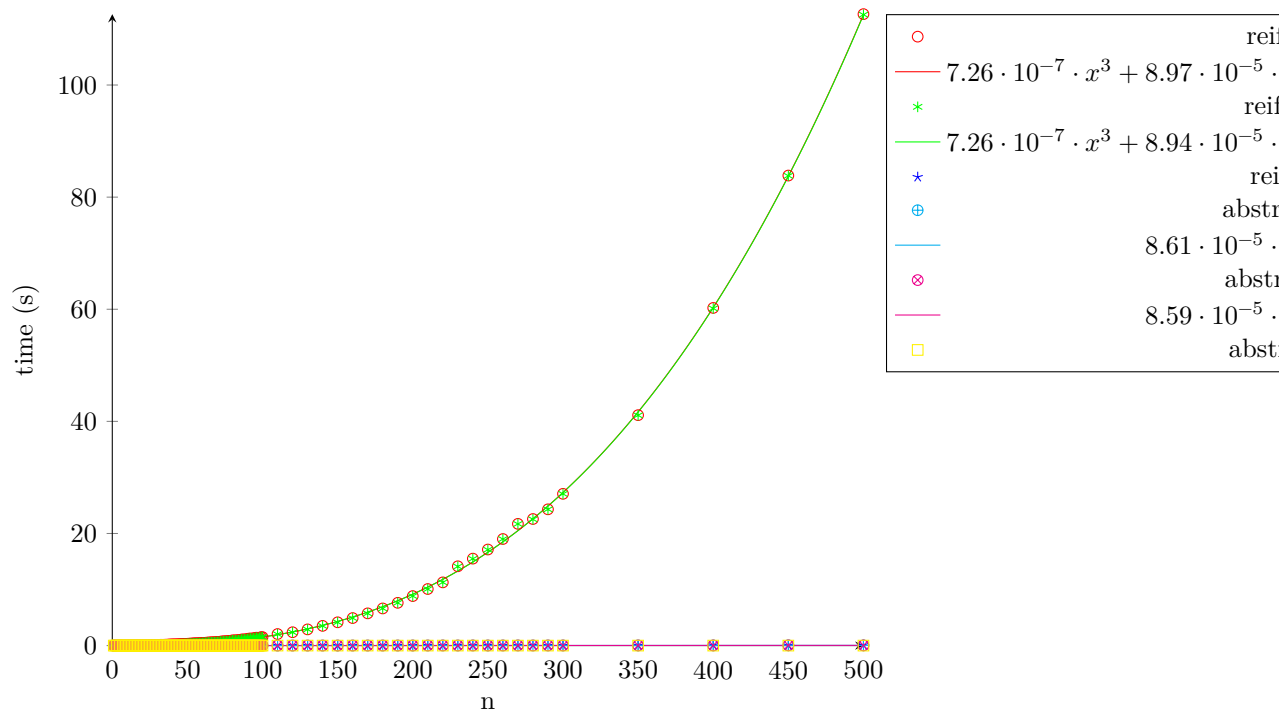
Figure 13: timing-typeclass-reification-let-in-HOAS

Figure 14: timing-typeclass-reification-let-in-PHOAS