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

repeat-seto...
$1.9 \cdot 10^{-6} \cdot x^3 - 4.7 \cdot 10^{-5} \cdot x$
repeat-seto...
$1.9 \cdot 10^{-6} \cdot x^3 - 4.65 \cdot 10^{-5} \cdot x$
abstract+set...
$9.56 \cdot 10^{-7} \cdot x^3 - 1.57 \cdot 10^{-6} \cdot$
abstract+set...
$9.55 \cdot 10^{-7} \cdot x^3 - 1.17 \cdot 10^{-6} \cdot$
setoid-r...
$9.52 \cdot 10^{-7} \cdot x^3 - 2.1 \cdot 10^{-5} \cdot$
setoid-r...
$9.5 \cdot 10^{-7} \cdot x^3 - 2.05 \cdot 10^{-5} \cdot$
noop-try-set...
$9.58 \cdot 10^{-7} \cdot x^3 - 2.65 \cdot 10^{-5} \cdot$
noop-try-set...
$9.57 \cdot 10^{-7} \cdot x^3 - 2.62 \cdot 10^{-5} \cdot$
noop-repeat-se...
$9.75 \cdot 10^{-7} \cdot x^3 - 4.23 \cdot 10^{-5} \cdot$
noop-repeat-se...
$9.74 \cdot 10^{-7} \cdot x^3 - 4.22 \cdot 10^{-5}$
close-abstract+...
$2.2 \cdot 10^{-5} \cdot x^2 - 1.6$
close-abstract+...
$2.2 \cdot 10^{-5} \cdot x^2 - 1.67$
repeat-seto...
setoid-r...
abstract+set...
noop-try-set...
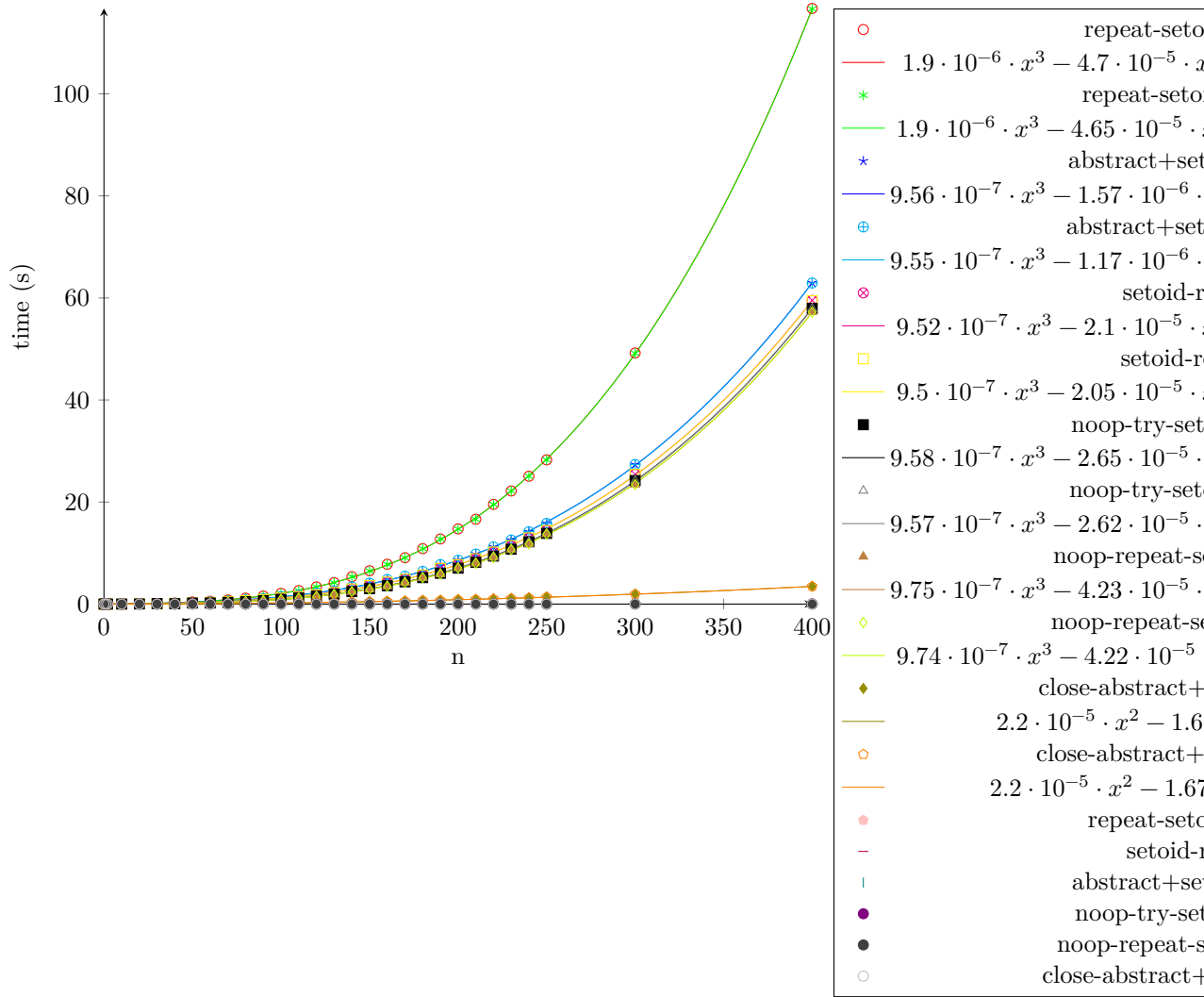noop-repeat-s...
close-abstract+...

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

3

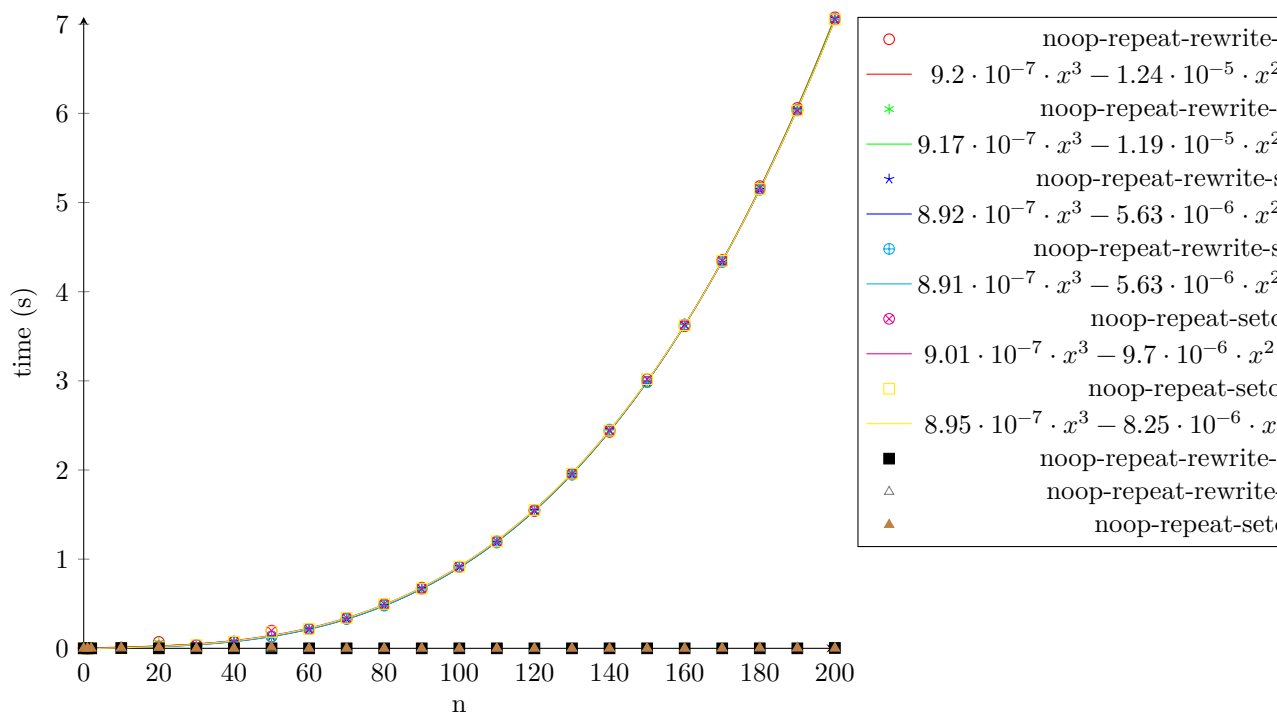Figure 4: timing-repeat-setoid-rewrite-under-binders-noop
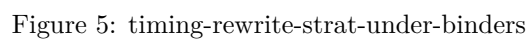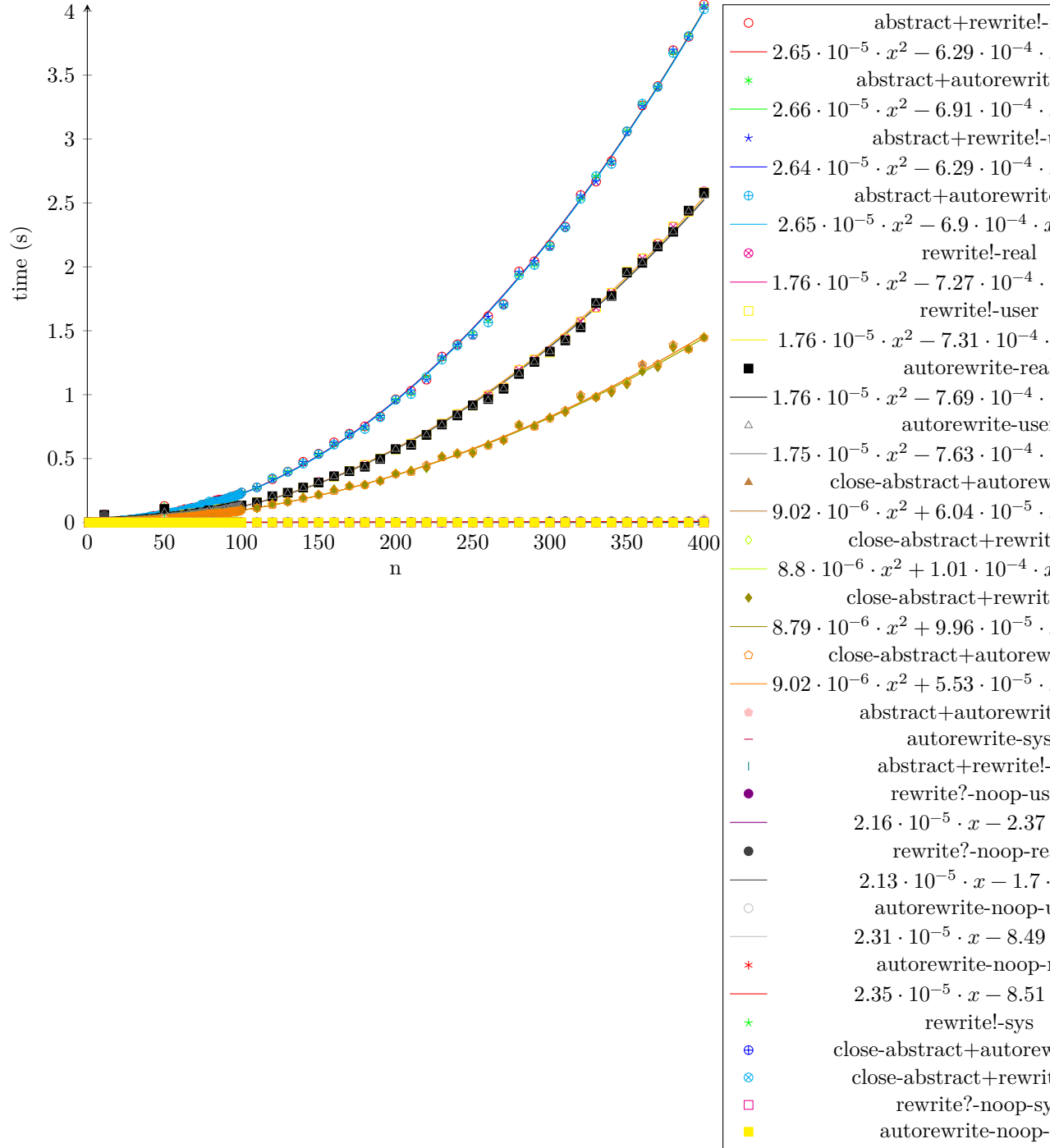
Figure 5: timing-rewrite-strat-under-binders

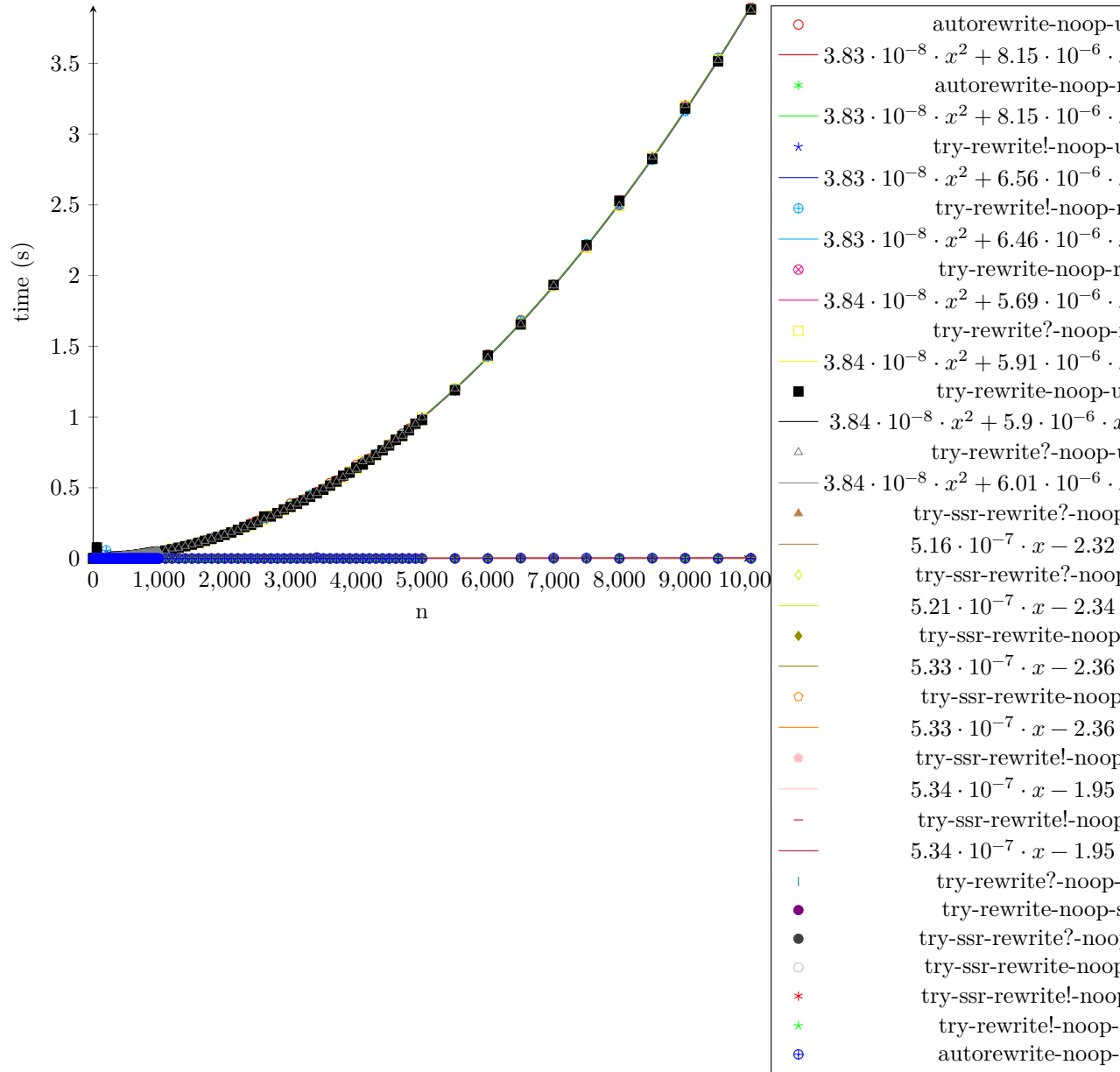Figure 6: timing-rewrite-repeated-app-autorewrite

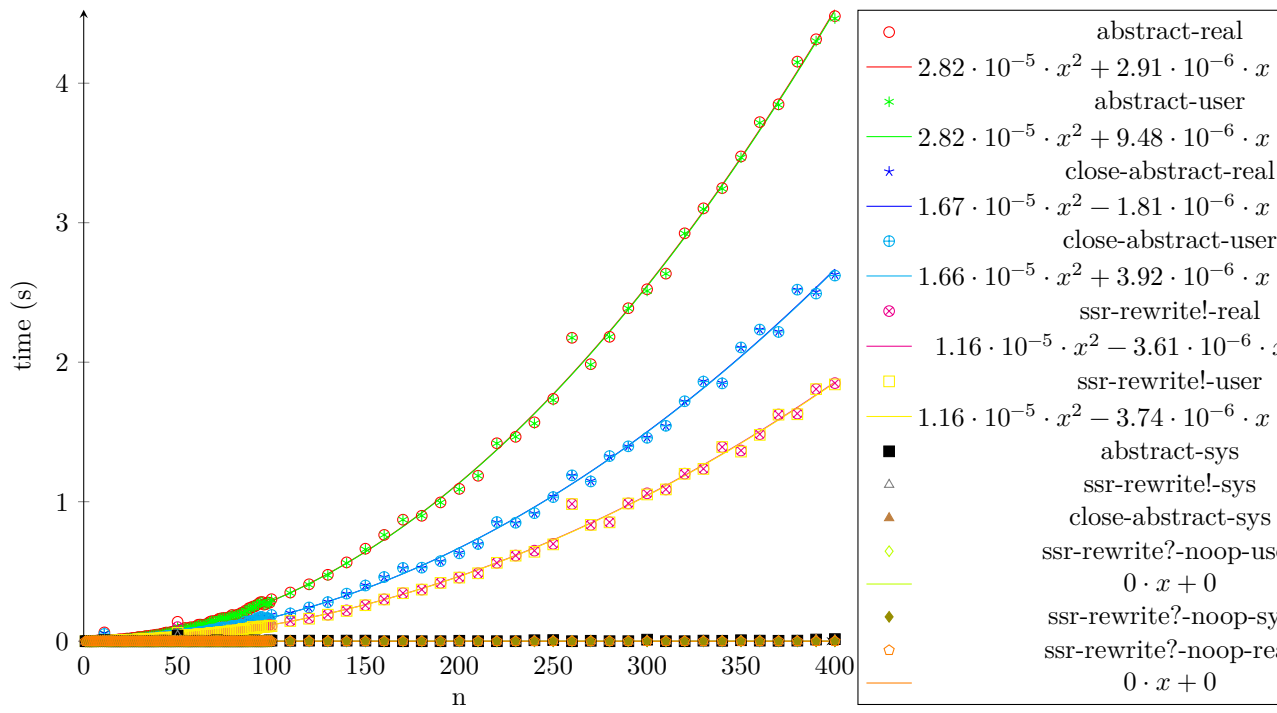Figure 7: timing-rewrite-repeated-app-autorewrite-noop

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 plot legend 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...
- abstract+rewrite-strat-topdow...
- rewrite-strat-topdown-sys...
- rewrite-strat-bottomup-sy...
- abstract+rewrite-strat-bottomu...
- rewrite-strat-topdown-noop-...
- rewrite-strat-topdown-noop-...
- rewrite-strat-bottomup-noop-...
- rewrite-strat-bottomup-noop-...
- close-abstract+rewrite-strat-topd...
- rewrite-strat-topdown-noop-...
- rewrite-strat-bottomup-noop...
- close-abstract+rewrite-strat-botto...
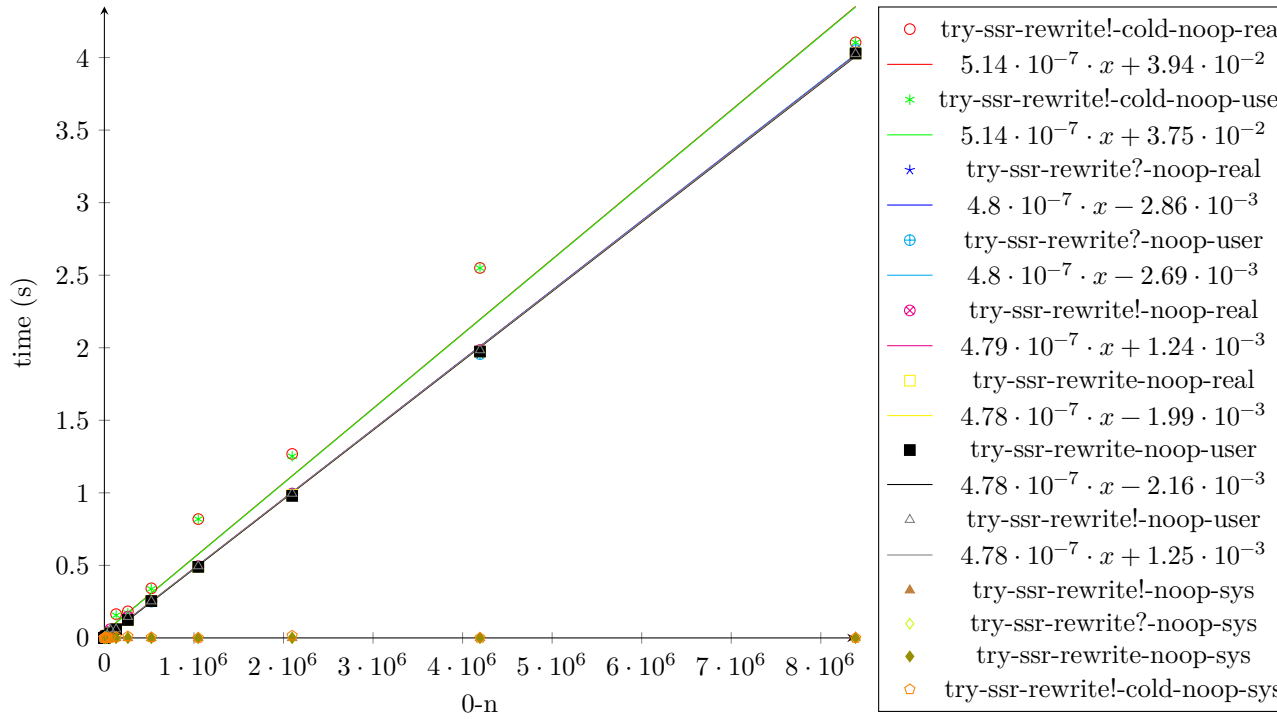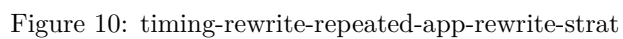
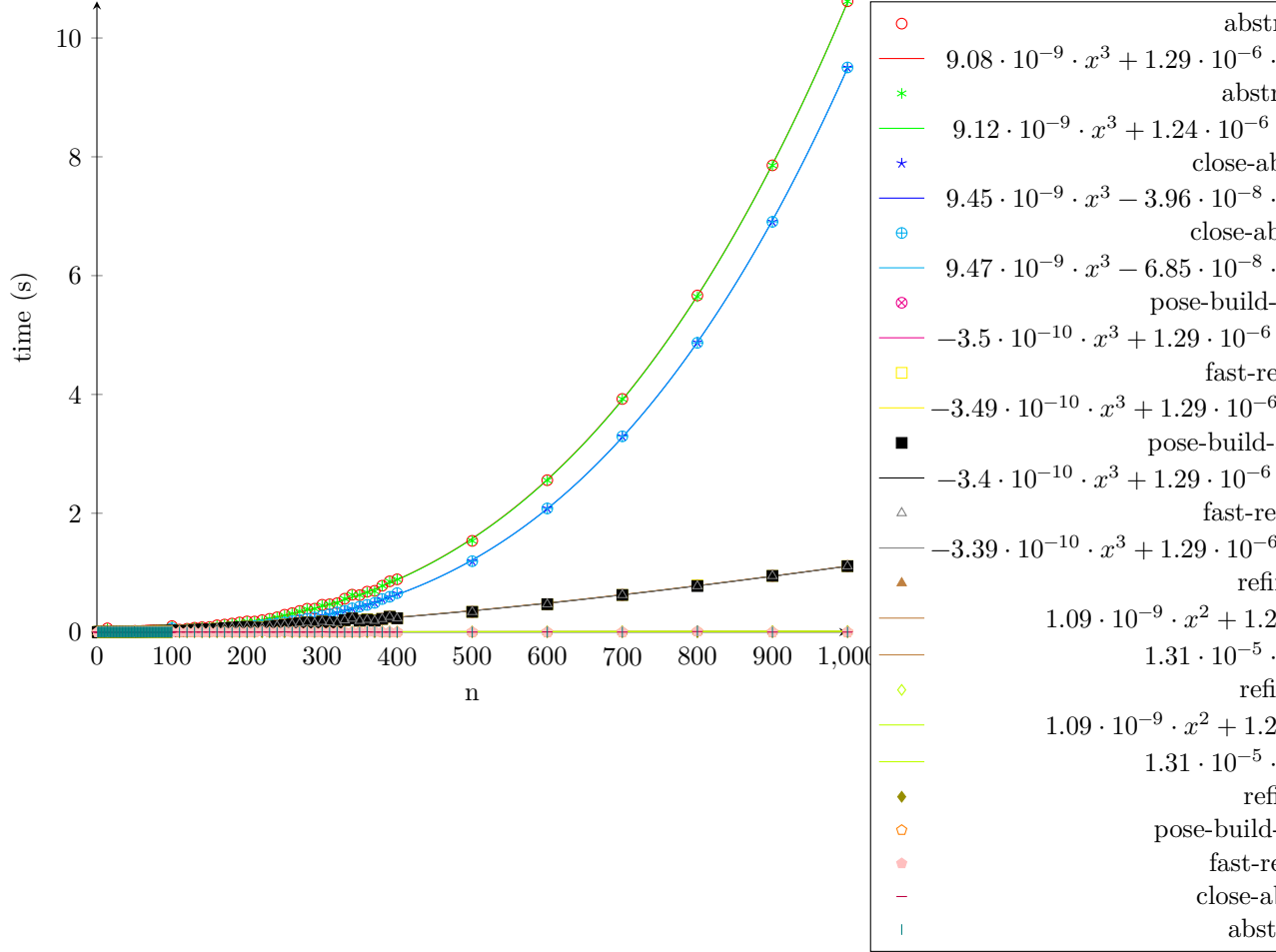Figure 11: timing-rewrite-repeated-app-fast-rewrite

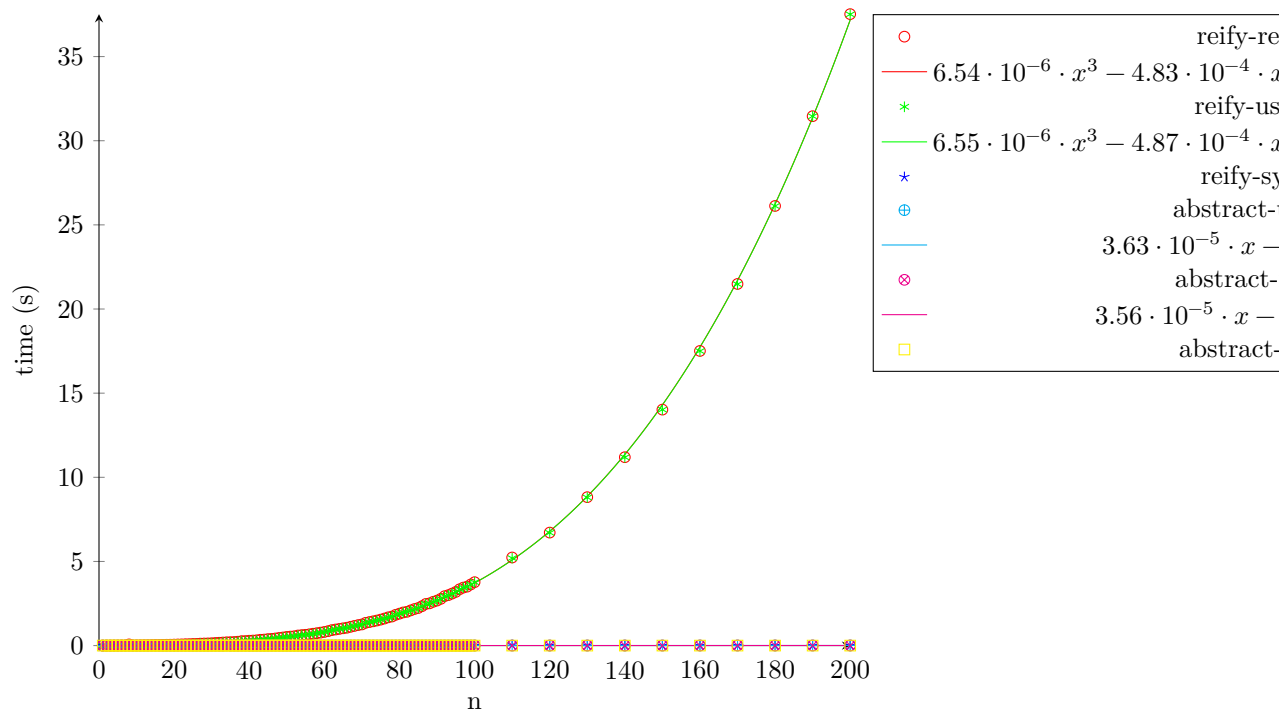Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
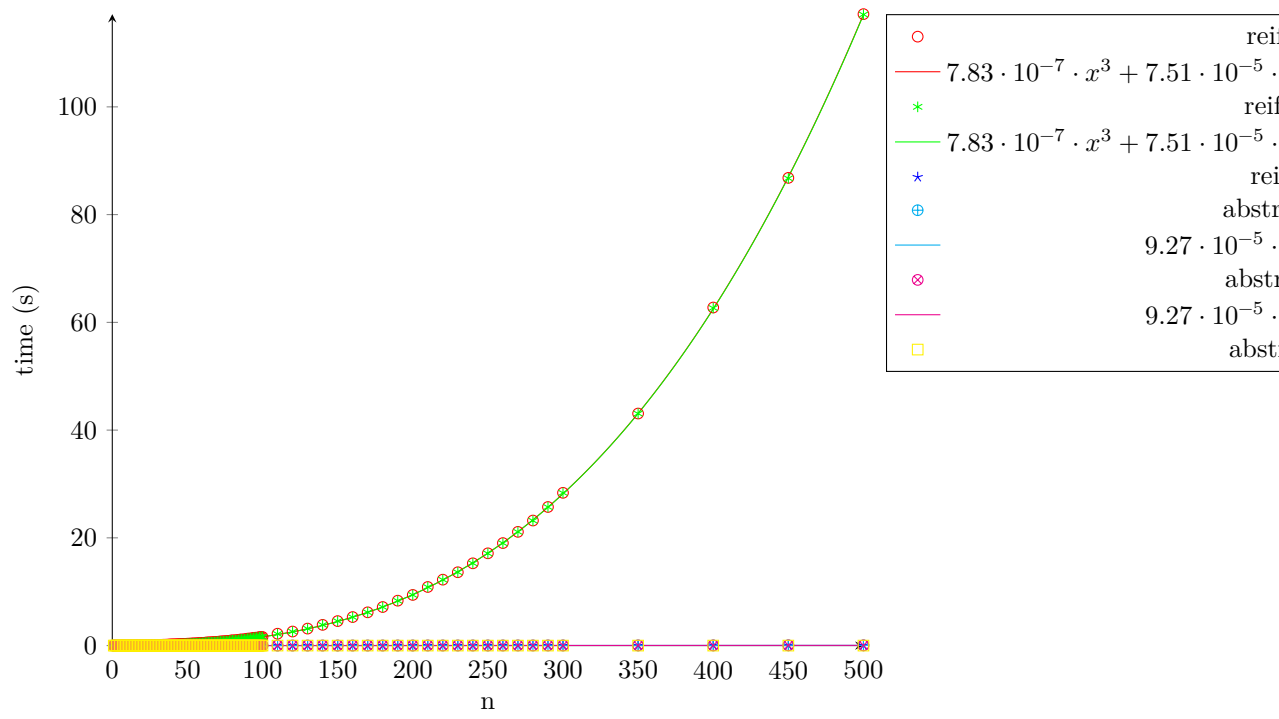
Figure 13: timing-typeclass-reification-let-in-HOAS

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

14

time (s)

n

Legend:

- abstract-real
- $2.82 \cdot 10^{-6} \cdot x^2 - 1.61 \cdot 10^{-3}$
- abstract-user
- $2.82 \cdot 10^{-6} \cdot x^2 - 1.61 \cdot 10^{-3}$
- fast-rewrite-real
- $2.53 \cdot 10^{-6} \cdot x^2 - 1.66 \cdot 10^{-3}$
- fast-rewrite-user
- $2.53 \cdot 10^{-6} \cdot x^2 - 1.67 \cdot 10^{-3}$
- type-pf-cast-real
- $4.05 \cdot 10^{-7} \cdot x^2 - 3.34 \cdot 10^{-4} \cdot x$
- type-pf-cast-user
- $4.05 \cdot 10^{-7} \cdot x^2 - 3.34 \cdot 10^{-4} \cdot x$
- type-admit-real
- $3.96 \cdot 10^{-7} \cdot x^2 - 3.31 \cdot 10^{-4} \cdot x$
- type-admit-user
- $3.97 \cdot 10^{-7} \cdot x^2 - 3.32 \cdot 10^{-4} \cdot x$
- close-abstract-real
- $2.88 \cdot 10^{-7} \cdot x^2 + 5.27 \cdot 10^{-5} \cdot$
- close-abstract-user
- $2.88 \cdot 10^{-7} \cdot x^2 + 5.31 \cdot 10^{-5} \cdot$
- type-admit-cast-real
- $3.84 \cdot 10^{-7} \cdot x^2 - 3.02 \cdot 10^{-4} \cdot$
- type-admit-cast-user
- $3.84 \cdot 10^{-7} \cdot x^2 - 3.02 \cdot 10^{-4} \cdot$
- check-admit-cast-user
- $3.87 \cdot 10^{-7} \cdot x^2 - 2.88 \cdot 10^{-4} \cdot$
- check-admit-cast-real
- $3.87 \cdot 10^{-7} \cdot x^2 - 2.88 \cdot 10^{-4} \cdot$
- check-pf-cast-real
- $3.54 \cdot 10^{-7} \cdot x^2 - 2.37 \cdot 10^{-4} \cdot$
- check-pf-cast-user
- $3.54 \cdot 10^{-7} \cdot x^2 - 2.37 \cdot 10^{-4} \cdot$
- refine-user
- $3.51 \cdot 10^{-7} \cdot x^2 - 2.67 \cdot 10^{-4} \cdot$
- $4.62 \cdot 10^{-4} \cdot x - 5.53 \cdot$
- refine-real
- $3.51 \cdot 10^{-7} \cdot x^2 - 2.66 \cdot 10^{-4} \cdot$
- $4.62 \cdot 10^{-4} \cdot x - 5.53 \cdot$
- check-admit-real
- $2.52 \cdot 10^{-7} \cdot x^2 - 1.03 \cdot 10^{-4} \cdot$
- check-admit-user
- $2.52 \cdot 10^{-7} \cdot x^2 - 1.04 \cdot 10^{-4} \cdot$
- build-eval-thunk-real
- $1.2 \cdot 10^{-4} \cdot x - 7.77 \cdot$
- build-thunk-real
- $1.19 \cdot 10^{-4} \cdot x - 8.41 \cdot$
- build-eval-thunk-user
- $1.19 \cdot 10^{-4} \cdot x - 7.93 \cdot$
- build-thunk-user
- $1.17 \cdot 10^{-4} \cdot x - 8.22 \cdot$
- check-L-user