Figure 1: timing-pattern

1

Figure 2: timing-n-polymorphic-universes param-1-n 0

The plot contains the following legend entries and fit curves:

- abstract-real: $9.58 \cdot 10^{-8} \cdot x^2 + 3.63 \cdot 10^{-4} \cdot x$
- abstract-user: $9.57 \cdot 10^{-8} \cdot x^2 + 3.59 \cdot 10^{-4} \cdot x$
- close-abstract-real: $9.57 \cdot 10^{-8} \cdot x^2 + 2.9 \cdot 10^{-4} \cdot x$
- close-abstract-user: $9.58 \cdot 10^{-8} \cdot x^2 + 2.86 \cdot 10^{-4} \cdot x$
- exact-real: $7.35 \cdot 10^{-5} \cdot x - 4.15$
- exact-user: $7.19 \cdot 10^{-5} \cdot x - 3.17$
- abstract-sys
- close-abstract-sys
- exact-sys

The x-axis is labeled "0-univ-count" and the y-axis is labeled "time (s)".
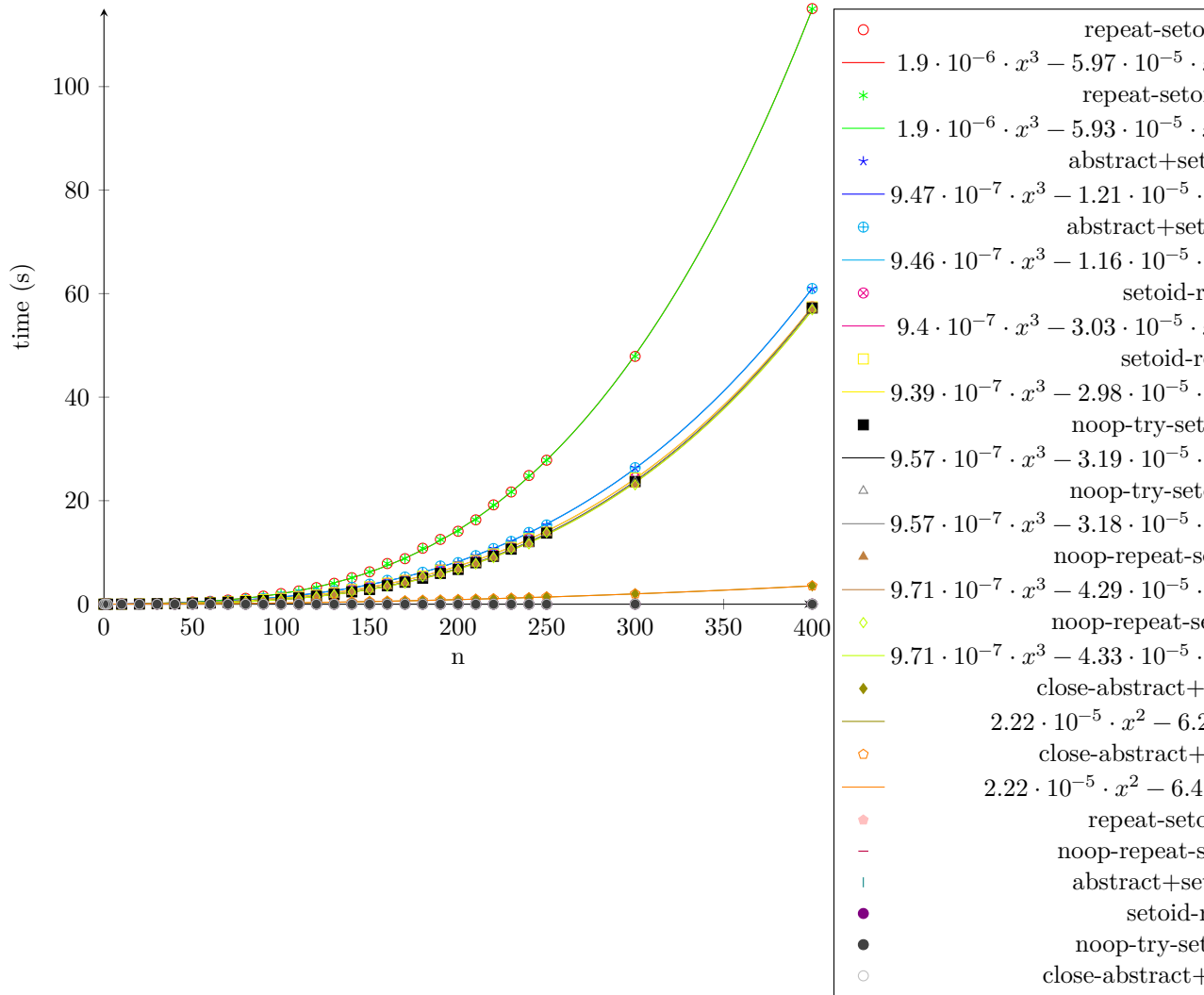
Figure 3: timing-repeat-setoid-rewrite-under-binders
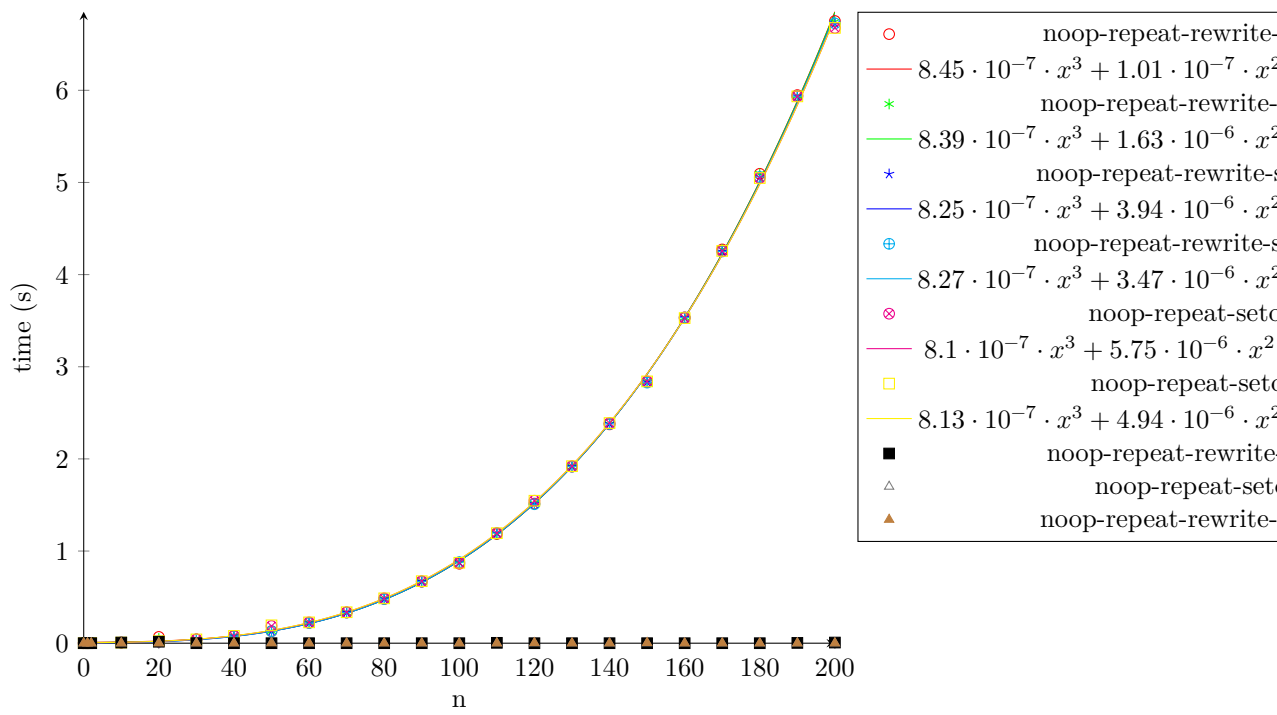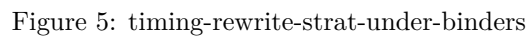
Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

4

Figure 5: timing-rewrite-strat-under-binders
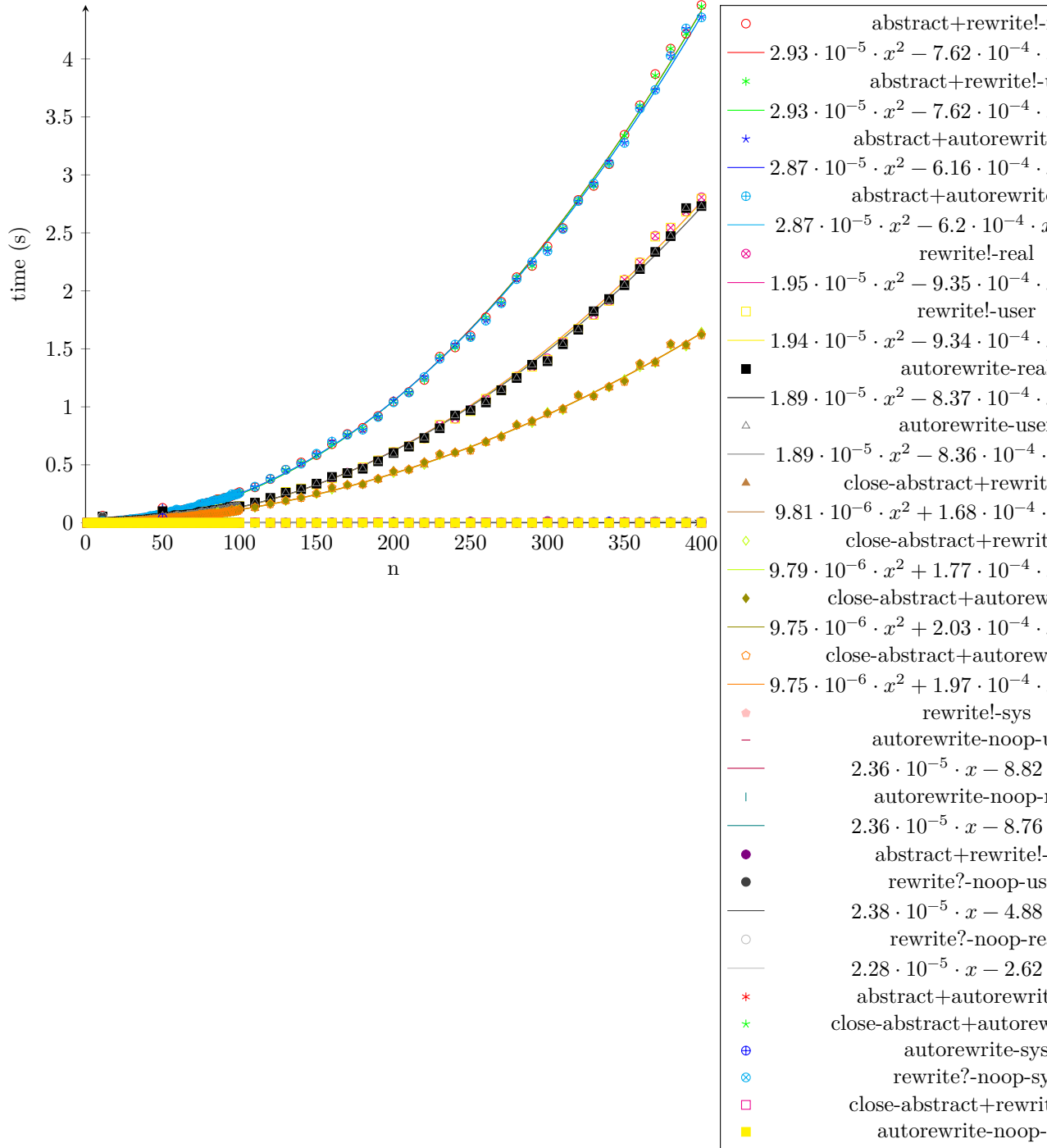
Figure 6: timing-rewrite-repeated-app-autorewrite
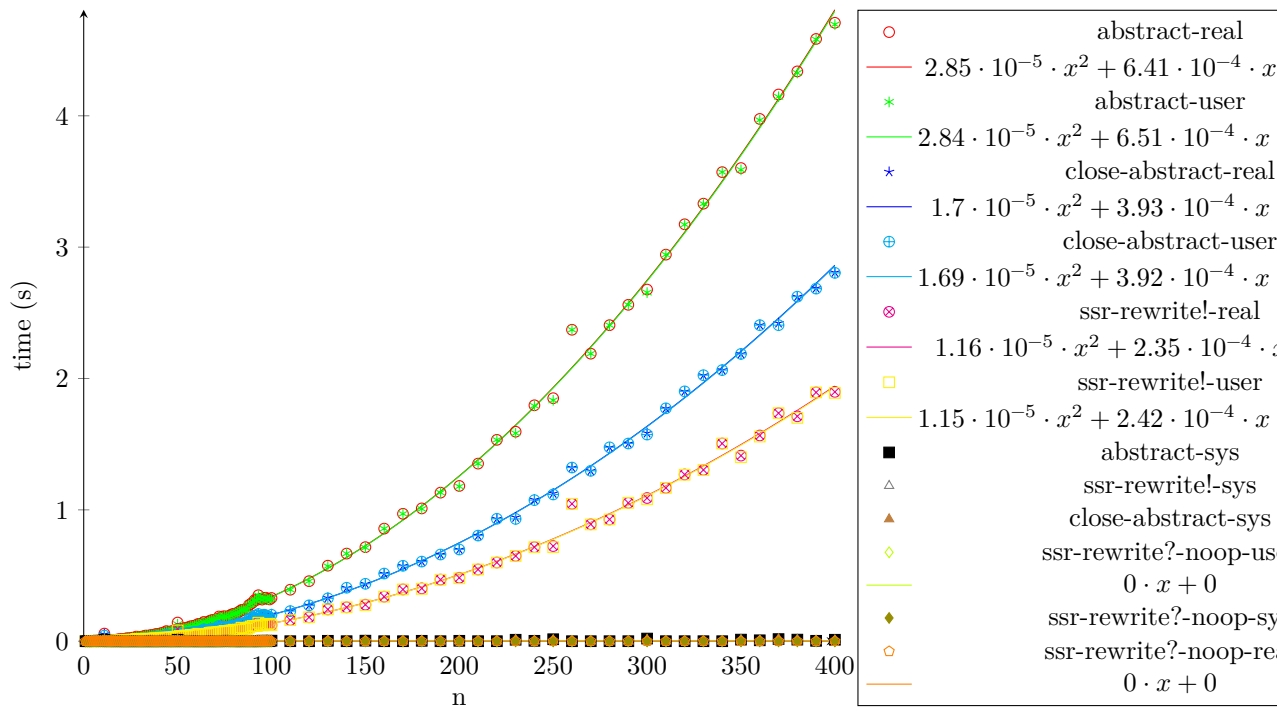
Figure 7: timing-rewrite-repeated-app-autorewrite-noop

Figure 8: timing-rewrite-repeated-app-ssrrewrite

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

The figure legend contains the following entries:

- try-ssr-rewrite!-cold-noop-user
  $5.13 \cdot 10^{-7} \cdot x + 3.09 \cdot 10^{-2}$
- try-ssr-rewrite!-cold-noop-real
  $5.13 \cdot 10^{-7} \cdot x + 3.16 \cdot 10^{-2}$
- try-ssr-rewrite?-noop-user
  $4.8 \cdot 10^{-7} \cdot x - 5.82 \cdot 10^{-5}$
- try-ssr-rewrite?-noop-real
  $4.8 \cdot 10^{-7} \cdot x - 5.82 \cdot 10^{-5}$
- try-ssr-rewrite!-noop-user
  $4.78 \cdot 10^{-7} \cdot x + 9.37 \cdot 10^{-4}$
- try-ssr-rewrite!-noop-real
  $4.78 \cdot 10^{-7} \cdot x + 9.37 \cdot 10^{-4}$
- try-ssr-rewrite-noop-user
  $4.76 \cdot 10^{-7} \cdot x - 8.92 \cdot 10^{-7}$
- try-ssr-rewrite-noop-real
  $4.76 \cdot 10^{-7} \cdot x + 3.2 \cdot 10^{-5}$
- try-ssr-rewrite?-noop-sys
- try-ssr-rewrite-noop-sys
- try-ssr-rewrite!-noop-sys
- try-ssr-rewrite!-cold-noop-sys

Axis labels: time (s) (vertical), 0-n (horizontal)

9
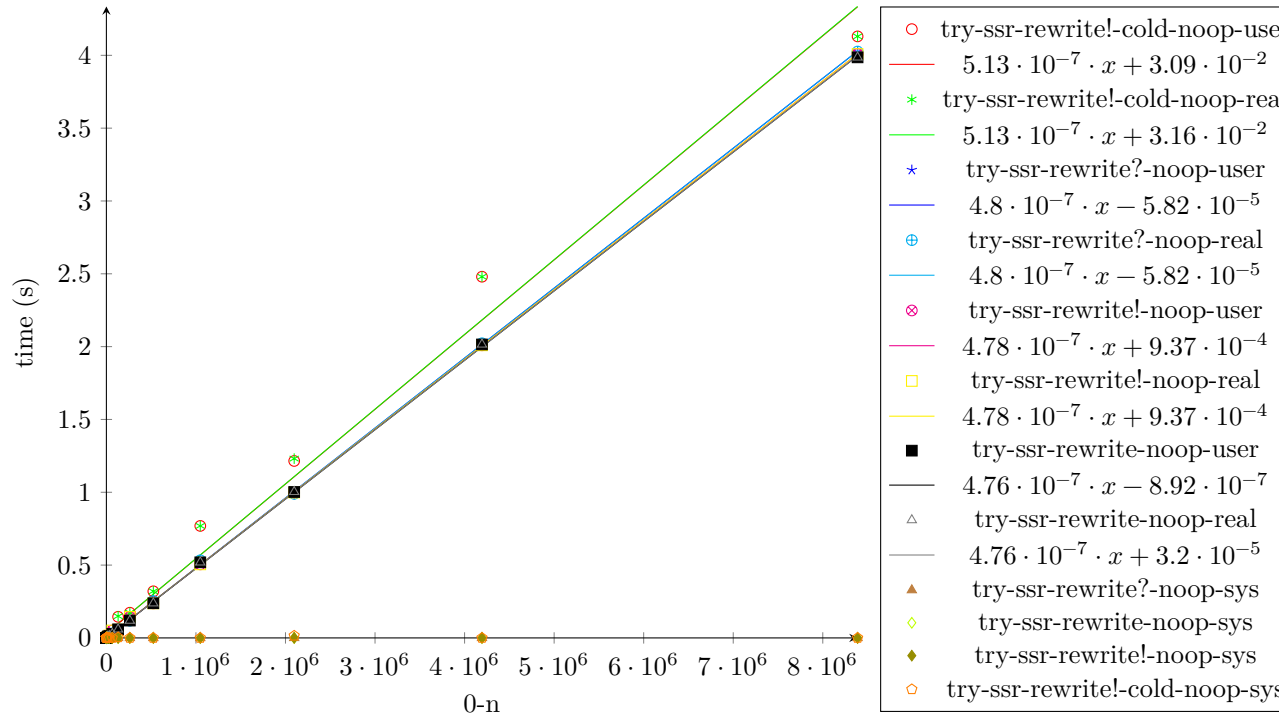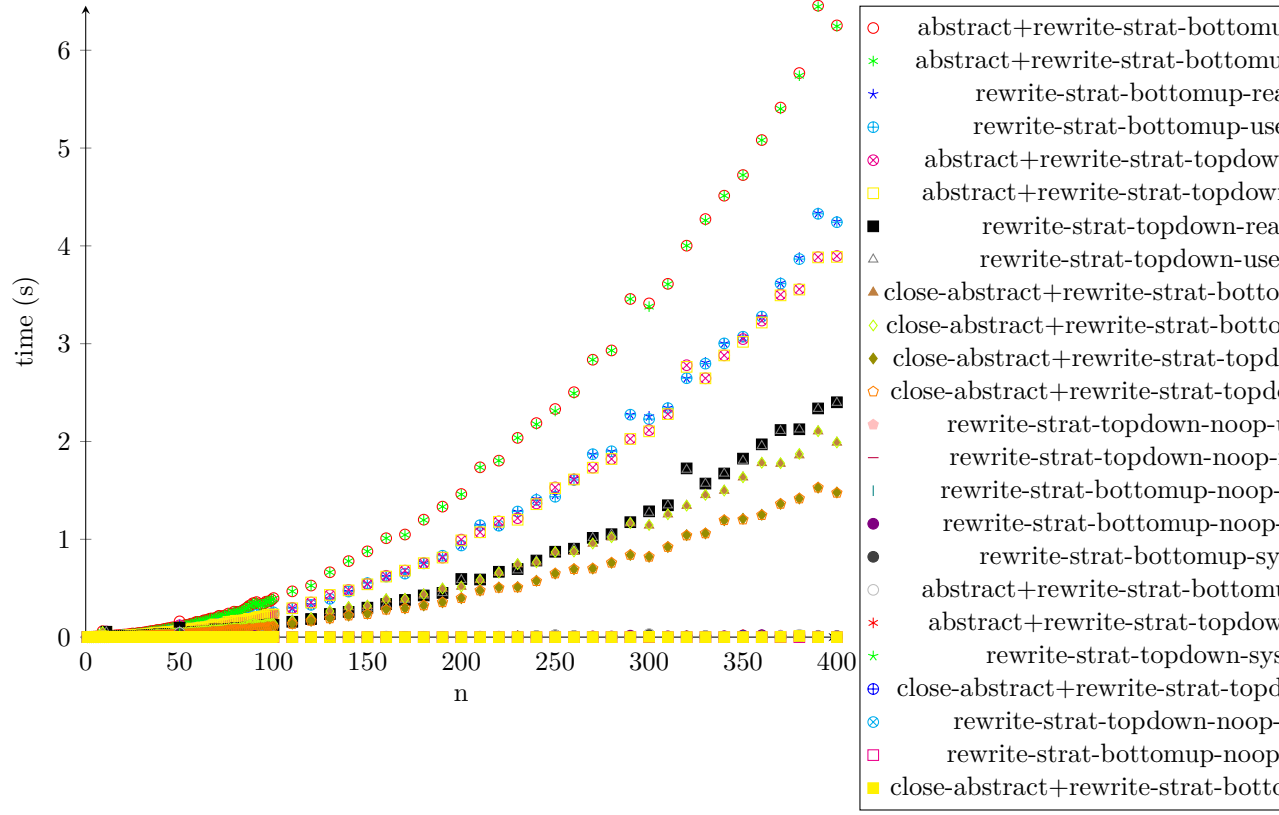
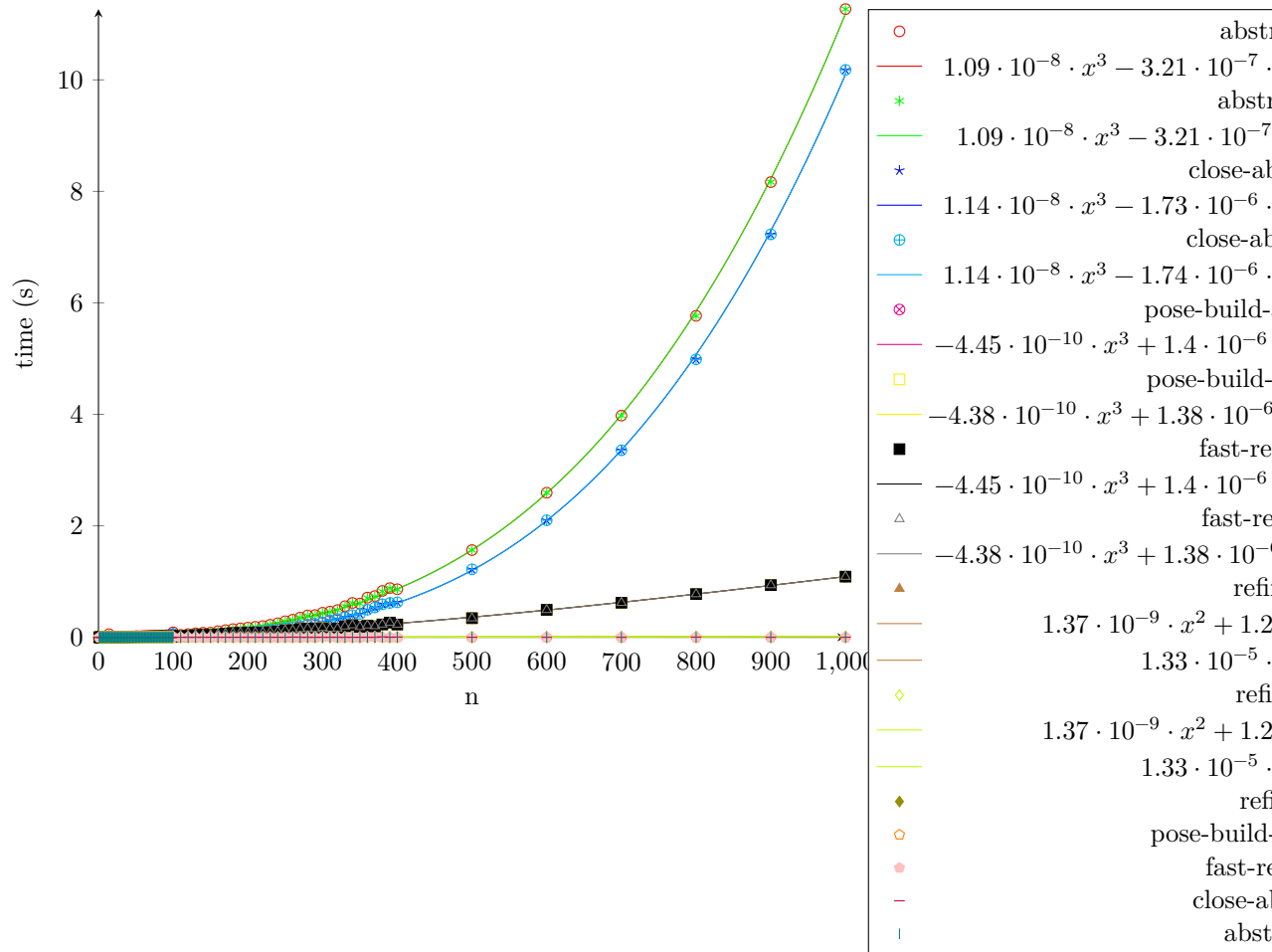Figure 10: timing-rewrite-repeated-app-rewrite-strat

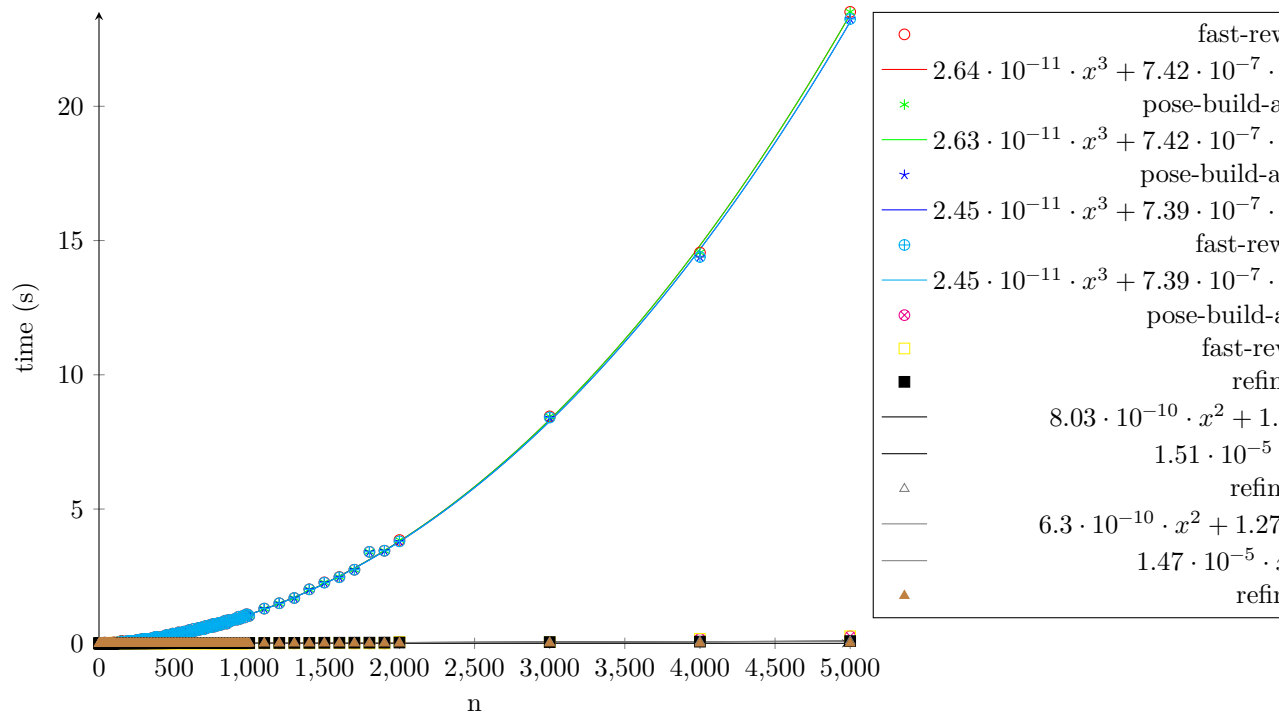Figure 11: timing-rewrite-repeated-app-fast-rewrite

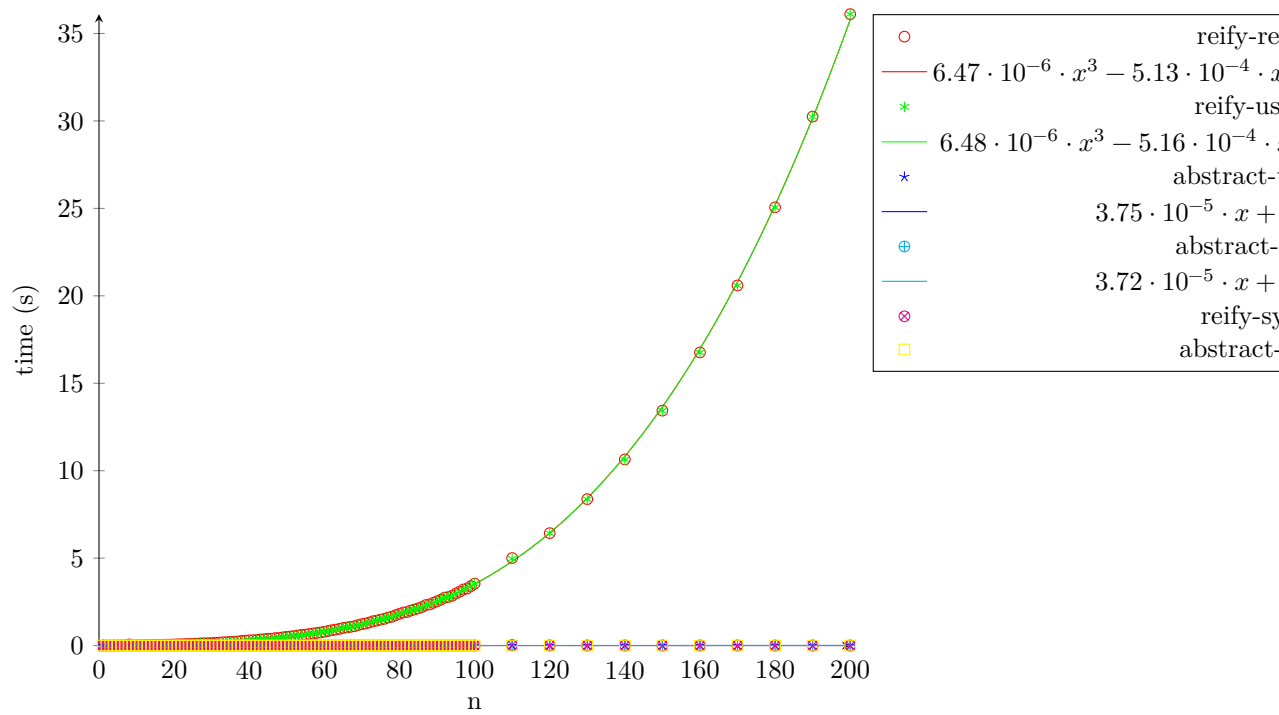Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
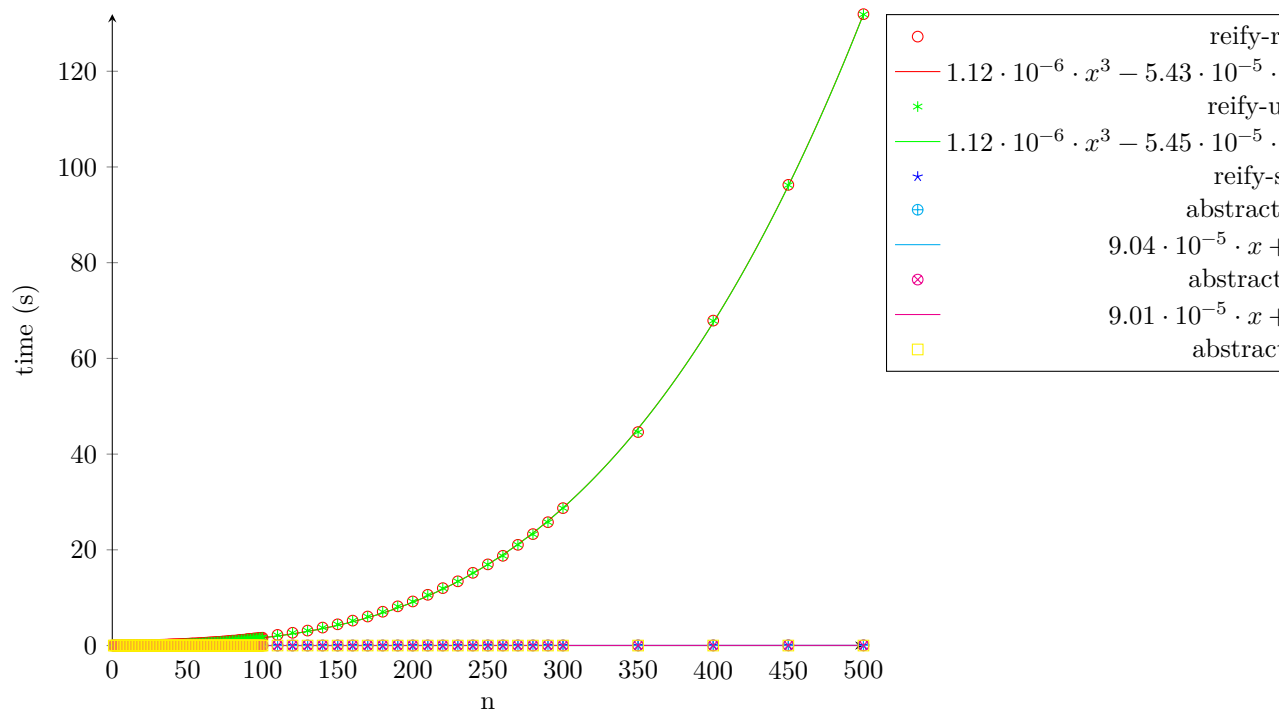
Figure 13: timing-typeclass-reification-let-in-HOAS

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

time (s)

20

18

16

14

12

10

8

6

4

2

0

0   500   1,000   1,500   2,000   2,500   3,000

n

abstract-real
$2.18 \cdot 10^{-6} \cdot x^2 + 2.21 \cdot 10^{-4} \cdot x$

abstract-user
$2.18 \cdot 10^{-6} \cdot x^2 + 2.2 \cdot 10^{-4} \cdot x$

fast-rewrite-real
$1.8 \cdot 10^{-6} \cdot x^2 + 1.67 \cdot 10^{-4} \cdot x$

fast-rewrite-user
$1.79 \cdot 10^{-6} \cdot x^2 + 1.68 \cdot 10^{-4} \cdot x$

close-abstract-user
$3.86 \cdot 10^{-7} \cdot x^2 + 5.07 \cdot 10^{-5} \cdot x$

close-abstract-real
$3.86 \cdot 10^{-7} \cdot x^2 + 5.15 \cdot 10^{-5} \cdot x$

check-pf-cast-user
$2.76 \cdot 10^{-7} \cdot x^2 - 2.21 \cdot 10^{-5} \cdot x$

check-pf-cast-real
$2.76 \cdot 10^{-7} \cdot x^2 - 2.2 \cdot 10^{-5} \cdot x$

type-admit-user
$2.71 \cdot 10^{-7} \cdot x^2 - 1.61 \cdot 10^{-5} \cdot x$

type-admit-real
$2.71 \cdot 10^{-7} \cdot x^2 - 1.58 \cdot 10^{-5} \cdot x$

refine-user
$2.67 \cdot 10^{-7} \cdot x^2 - 3.98 \cdot 10^{-5} \cdot x$
$5.14 \cdot 10^{-4} \cdot x - 5.54 \cdot$

refine-real
$2.66 \cdot 10^{-7} \cdot x^2 - 3.94 \cdot 10^{-5} \cdot x$
$5.14 \cdot 10^{-4} \cdot x - 5.54 \cdot$

type-pf-cast-user
$2.6 \cdot 10^{-7} \cdot x^2 - 2.71 \cdot 10^{-6} \cdot x$

type-pf-cast-real
$2.6 \cdot 10^{-7} \cdot x^2 - 2.36 \cdot 10^{-6} \cdot x$

type-admit-cast-user
$2.6 \cdot 10^{-7} \cdot x^2 + 7.45 \cdot 10^{-7} \cdot x$

type-admit-cast-real
$2.6 \cdot 10^{-7} \cdot x^2 + 6.99 \cdot 10^{-7} \cdot x$

check-admit-cast-user
$2.61 \cdot 10^{-7} \cdot x^2 - 1.71 \cdot 10^{-5} \cdot x$

check-admit-cast-real
$2.61 \cdot 10^{-7} \cdot x^2 - 1.71 \cdot 10^{-5} \cdot x$

check-admit-user
$1.97 \cdot 10^{-7} \cdot x^2 + 7.71 \cdot 10^{-5} \cdot x$

check-admit-real
$1.97 \cdot 10^{-7} \cdot x^2 + 7.73 \cdot 10^{-5} \cdot x$

build-eval-thunk-real
$1.13 \cdot 10^{-4} \cdot x - 7.55 \cdot$

build-thunk-real
$1.12 \cdot 10^{-4} \cdot x - 7.76 \cdot$

build-eval-thunk-user
$1.12 \cdot 10^{-4} \cdot x - 9.26 \cdot$

build-thunk-user
$1.11 \cdot 10^{-4} \cdot x - 9.61 \cdot$