Figure 1: timing-pattern

1

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

time (s)

n

repeat-seto

$1.69 \cdot 10^{-6} \cdot x^3 - 7.92 \cdot 10^{-6} \cdot$

repeat-seto

$1.68 \cdot 10^{-6} \cdot x^3 - 6.11 \cdot 10^{-6} \cdot$

abstract+set

$8.2 \cdot 10^{-7} \cdot x^3 + 1.89 \cdot 10^{-5} \cdot$

abstract+set

$8.18 \cdot 10^{-7} \cdot x^3 + 1.95 \cdot 10^{-5} \cdot$

setoid-r

$8.21 \cdot 10^{-7} \cdot x^3 + 7.61 \cdot 10^{-6} \cdot$

setoid-r

$8.19 \cdot 10^{-7} \cdot x^3 + 8.26 \cdot 10^{-6} \cdot$

noop-try-set

$8.78 \cdot 10^{-7} \cdot x^3 - 2.15 \cdot 10^{-5} \cdot$

noop-try-set

$8.76 \cdot 10^{-7} \cdot x^3 - 2.11 \cdot 10^{-5} \cdot$

noop-repeat-s

$8.49 \cdot 10^{-7} \cdot x^3 - 5.97 \cdot 10^{-6} \cdot$

noop-repeat-s

$8.49 \cdot 10^{-7} \cdot x^3 - 6.28 \cdot 10^{-6} \cdot$

close-abstract+

$1.08 \cdot 10^{-5} \cdot x^2 + 4$

close-abstract+

$1.08 \cdot 10^{-5} \cdot x^2 + 3.8$

repeat-seto

setoid-r

noop-try-set
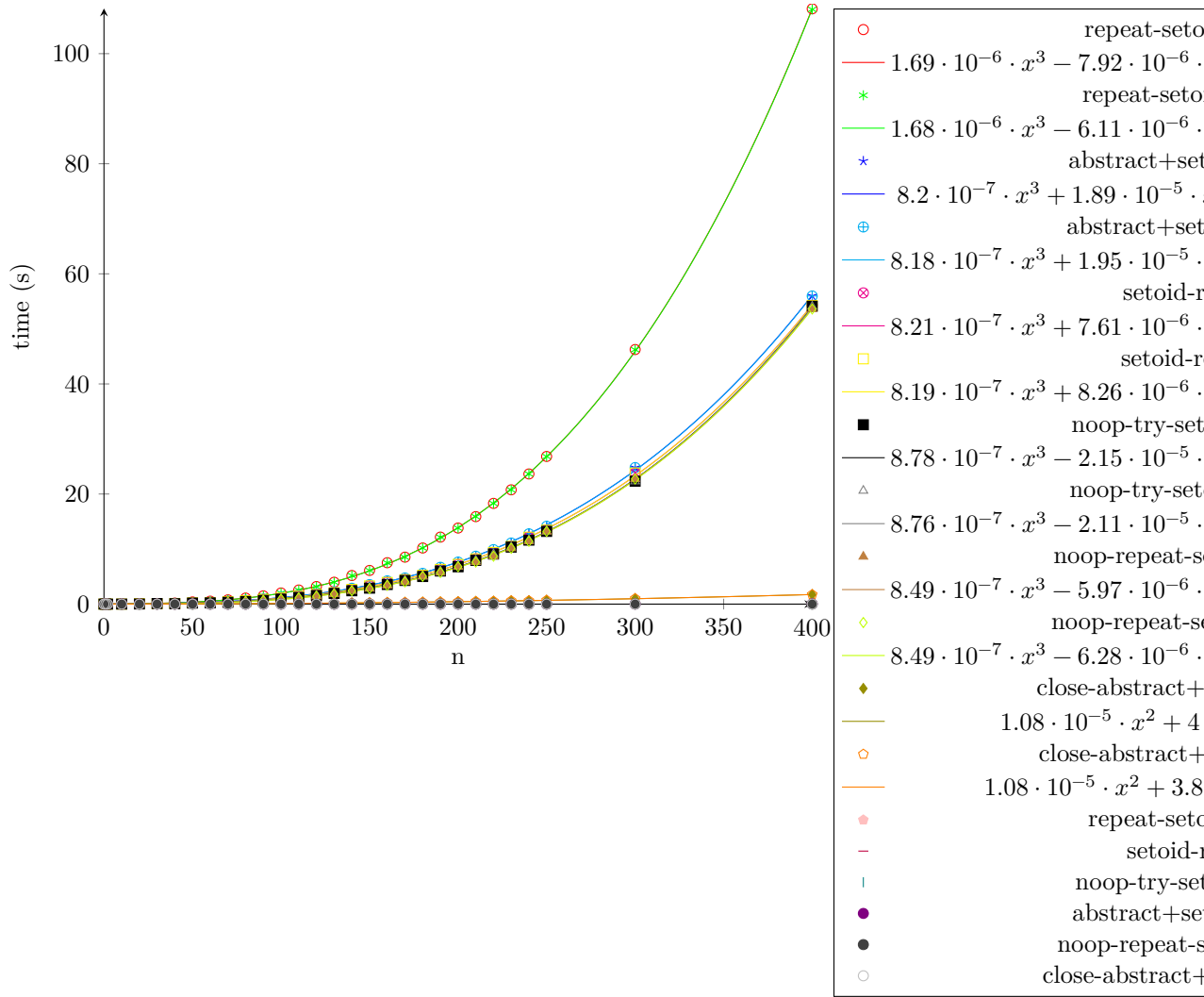
abstract+se

noop-repeat-s

close-abstract+

Figure 3: timing-repeat-setoid-rewrite-under-binders
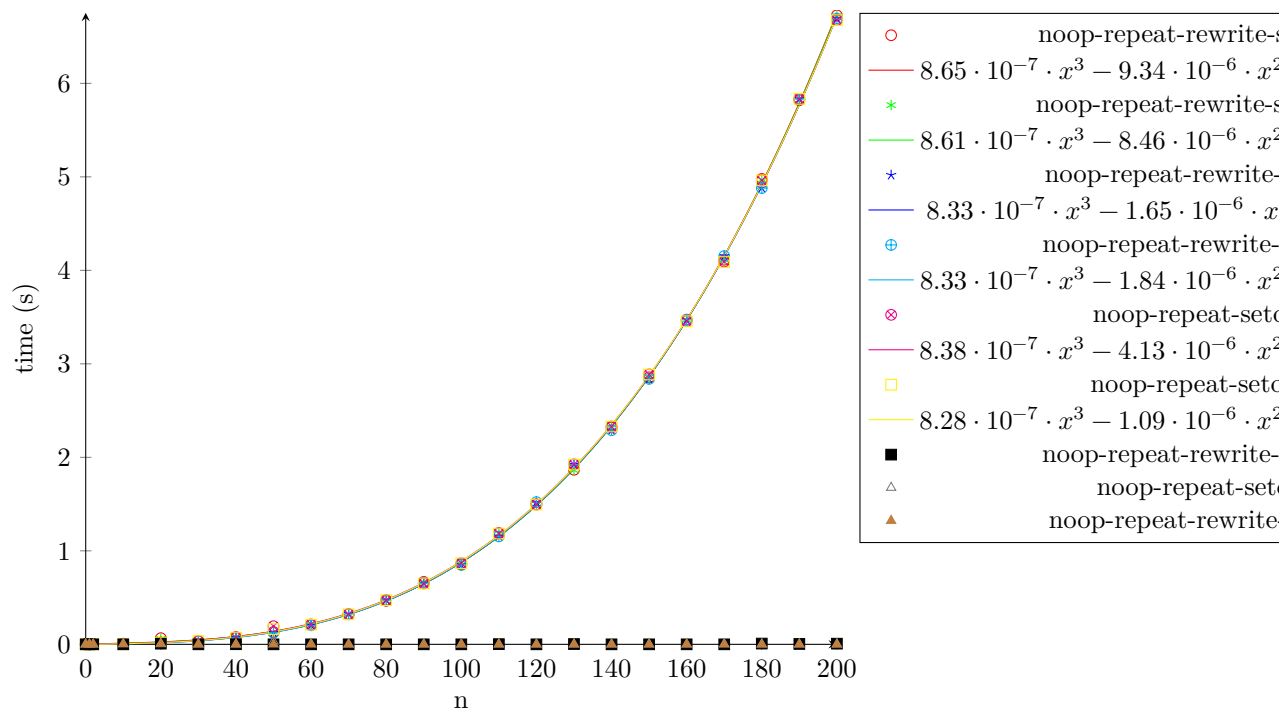
Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

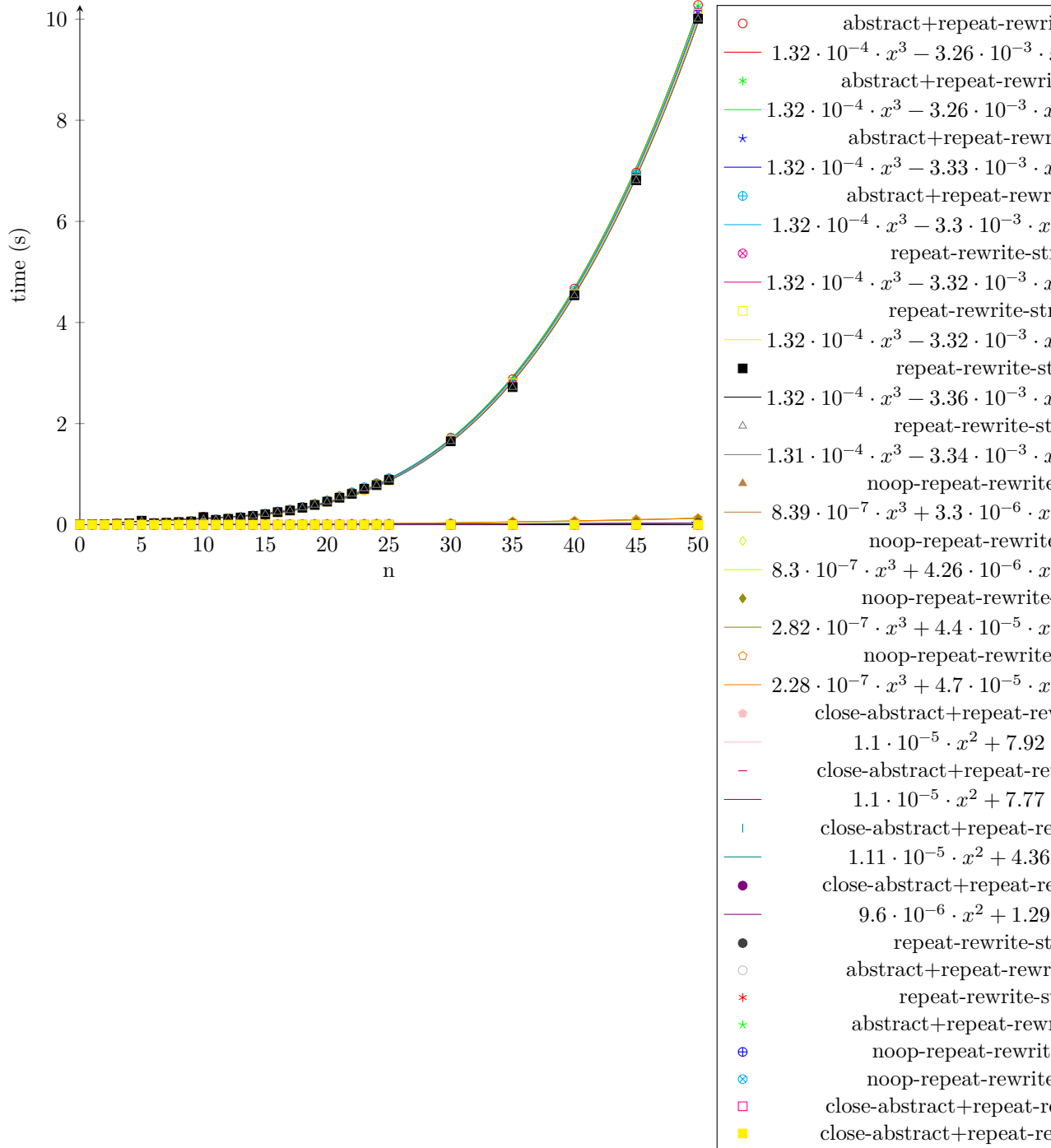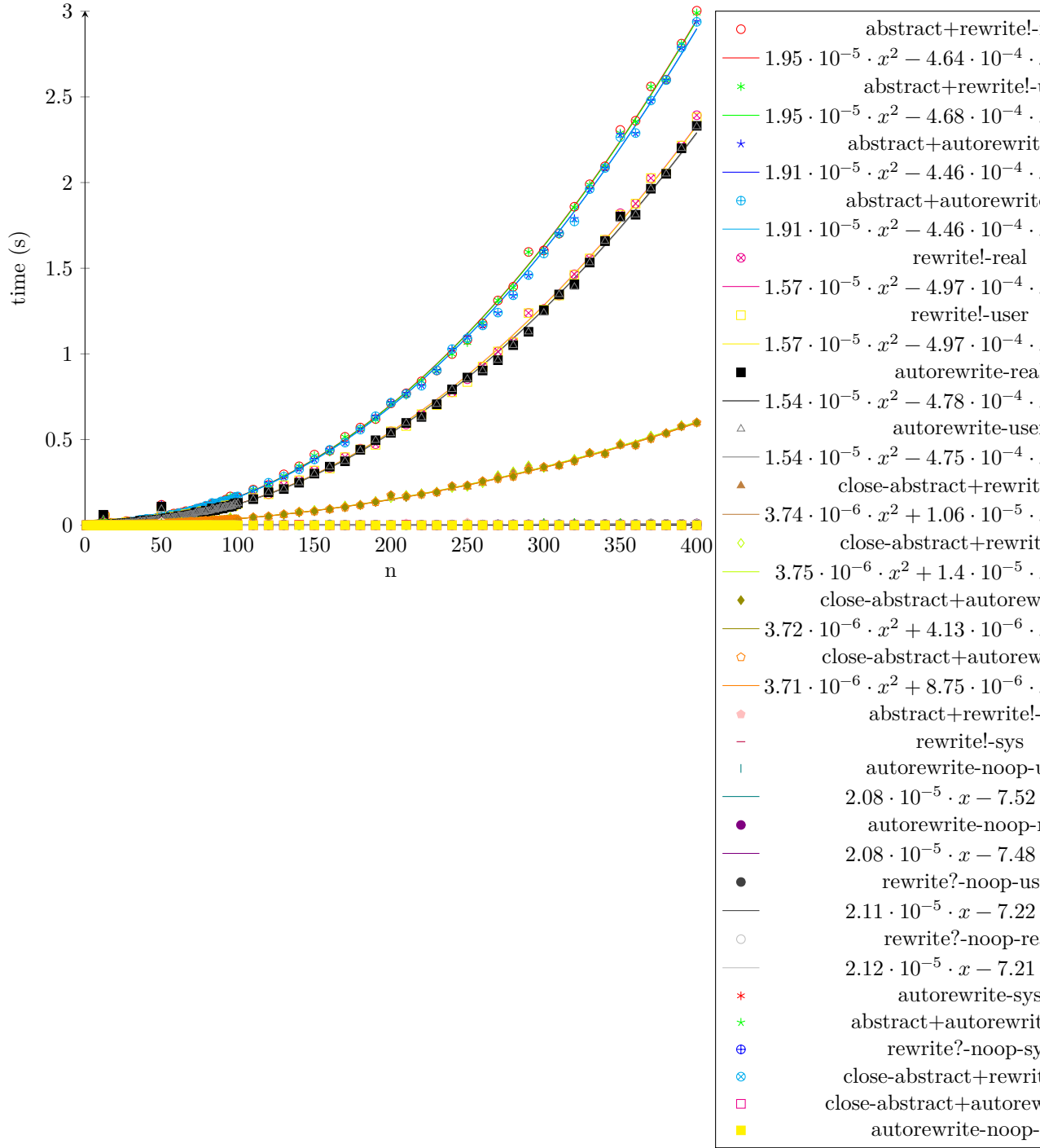Figure 5: timing-rewrite-strat-under-binders

time (s)

3

2.5

2

1.5

1

0.5

0

0   50   100   150   200   250   300   350   400

n

abstract+rewrite!-
$1.95 \cdot 10^{-5} \cdot x^2 - 4.64 \cdot 10^{-4} \cdot$
abstract+rewrite!-
$1.95 \cdot 10^{-5} \cdot x^2 - 4.68 \cdot 10^{-4} \cdot$
abstract+autorewri
$1.91 \cdot 10^{-5} \cdot x^2 - 4.46 \cdot 10^{-4} \cdot$
abstract+autorewri
$1.91 \cdot 10^{-5} \cdot x^2 - 4.46 \cdot 10^{-4} \cdot$
rewrite!-real
$1.57 \cdot 10^{-5} \cdot x^2 - 4.97 \cdot 10^{-4} \cdot$
rewrite!-user
$1.57 \cdot 10^{-5} \cdot x^2 - 4.97 \cdot 10^{-4} \cdot$
autorewrite-rea
$1.54 \cdot 10^{-5} \cdot x^2 - 4.78 \cdot 10^{-4} \cdot$
autorewrite-use
$1.54 \cdot 10^{-5} \cdot x^2 - 4.75 \cdot 10^{-4} \cdot$
close-abstract+rewrit
$3.74 \cdot 10^{-6} \cdot x^2 + 1.06 \cdot 10^{-5} \cdot$
close-abstract+rewrit
$3.75 \cdot 10^{-6} \cdot x^2 + 1.4 \cdot 10^{-5} \cdot$
close-abstract+autorew
$3.72 \cdot 10^{-6} \cdot x^2 + 4.13 \cdot 10^{-6} \cdot$
close-abstract+autorew
$3.71 \cdot 10^{-6} \cdot x^2 + 8.75 \cdot 10^{-6} \cdot$
abstract+rewrite!-
rewrite!-sys
autorewrite-noop-u
$2.08 \cdot 10^{-5} \cdot x - 7.52$
autorewrite-noop-r
$2.08 \cdot 10^{-5} \cdot x - 7.48$
rewrite?-noop-us
$2.11 \cdot 10^{-5} \cdot x - 7.22$
rewrite?-noop-re
$2.12 \cdot 10^{-5} \cdot x - 7.21$
autorewrite-sys
abstract+autorewrit
rewrite?-noop-sy
close-abstract+rewrit
close-abstract+autorew
autorewrite-noop-

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

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

The legend entries (partially cut off):

- try-rewrite-noop-r
- $3.21 \cdot 10^{-8} \cdot x^2 + 2.26 \cdot 10^{-6} \cdot x$
- try-rewrite-noop-u
- $3.21 \cdot 10^{-8} \cdot x^2 + 1.69 \cdot 10^{-6} \cdot x$
- try-rewrite?-noop-r
- $3.07 \cdot 10^{-8} \cdot x^2 + 7.97 \cdot 10^{-6} \cdot x$
- try-rewrite?-noop-u
- $3.07 \cdot 10^{-8} \cdot x^2 + 7.98 \cdot 10^{-6} \cdot x$
- autorewrite-noop-r
- $3.12 \cdot 10^{-8} \cdot x^2 + 7.3 \cdot 10^{-6} \cdot x$
- autorewrite-noop-u
- $3.12 \cdot 10^{-8} \cdot x^2 + 7.19 \cdot 10^{-6} \cdot x$
- try-rewrite!-noop-u
- $3.09 \cdot 10^{-8} \cdot x^2 + 6.72 \cdot 10^{-6} \cdot x$
- try-rewrite!-noop-r
- $3.09 \cdot 10^{-8} \cdot x^2 + 6.77 \cdot 10^{-6} \cdot x$
- try-ssr-rewrite?-noop
- $3.98 \cdot 10^{-7} \cdot x - 1.72$
- try-ssr-rewrite?-noop
- $3.98 \cdot 10^{-7} \cdot x - 1.68$
- try-ssr-rewrite-noop
- $4.19 \cdot 10^{-7} \cdot x - 1.65$
- try-ssr-rewrite-noop
- $4.23 \cdot 10^{-7} \cdot x - 1.69$
- try-ssr-rewrite!-noop
- $4.49 \cdot 10^{-7} \cdot x - 1.9$
- try-ssr-rewrite!-noop
- $4.49 \cdot 10^{-7} \cdot x - 1.9$
- try-ssr-rewrite?-noo
- try-ssr-rewrite-noop
- try-ssr-rewrite!-noop
- try-rewrite?-noop-
- try-rewrite-noop-s
- try-rewrite!-noop-
- autorewrite-noop-

7

Figure 8: timing-rewrite-repeated-app-ssrrewrite
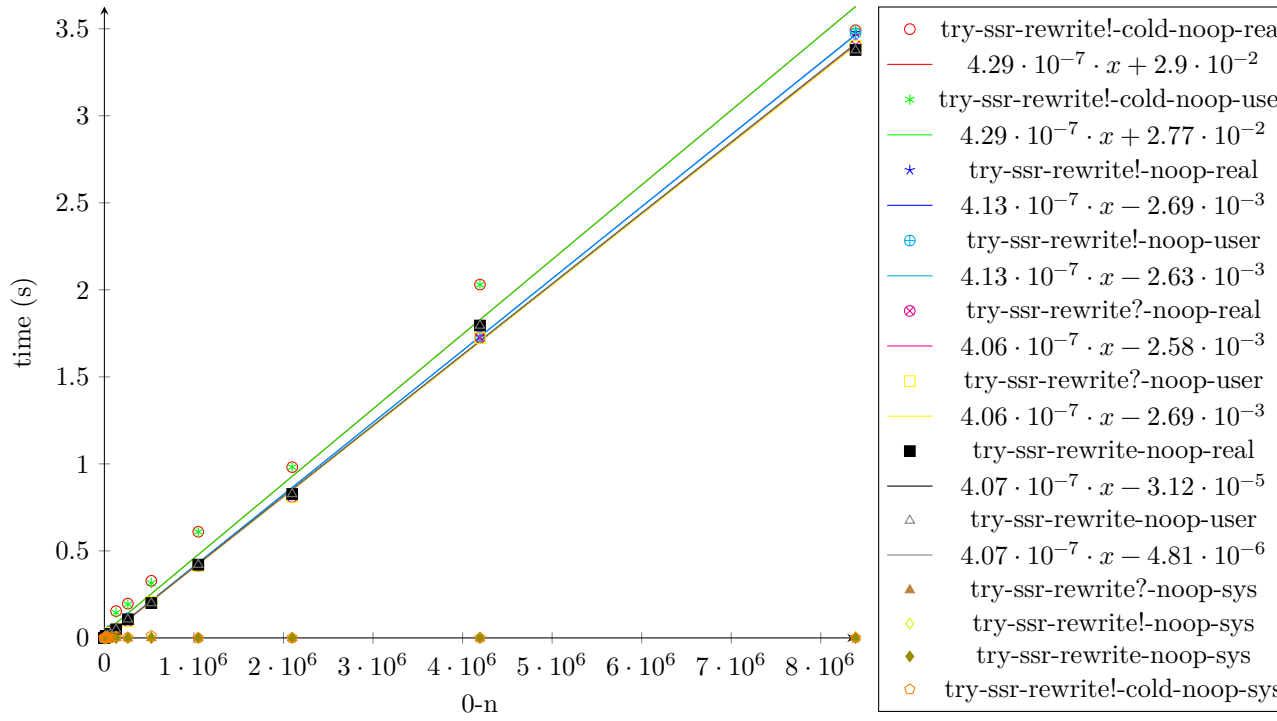
Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1
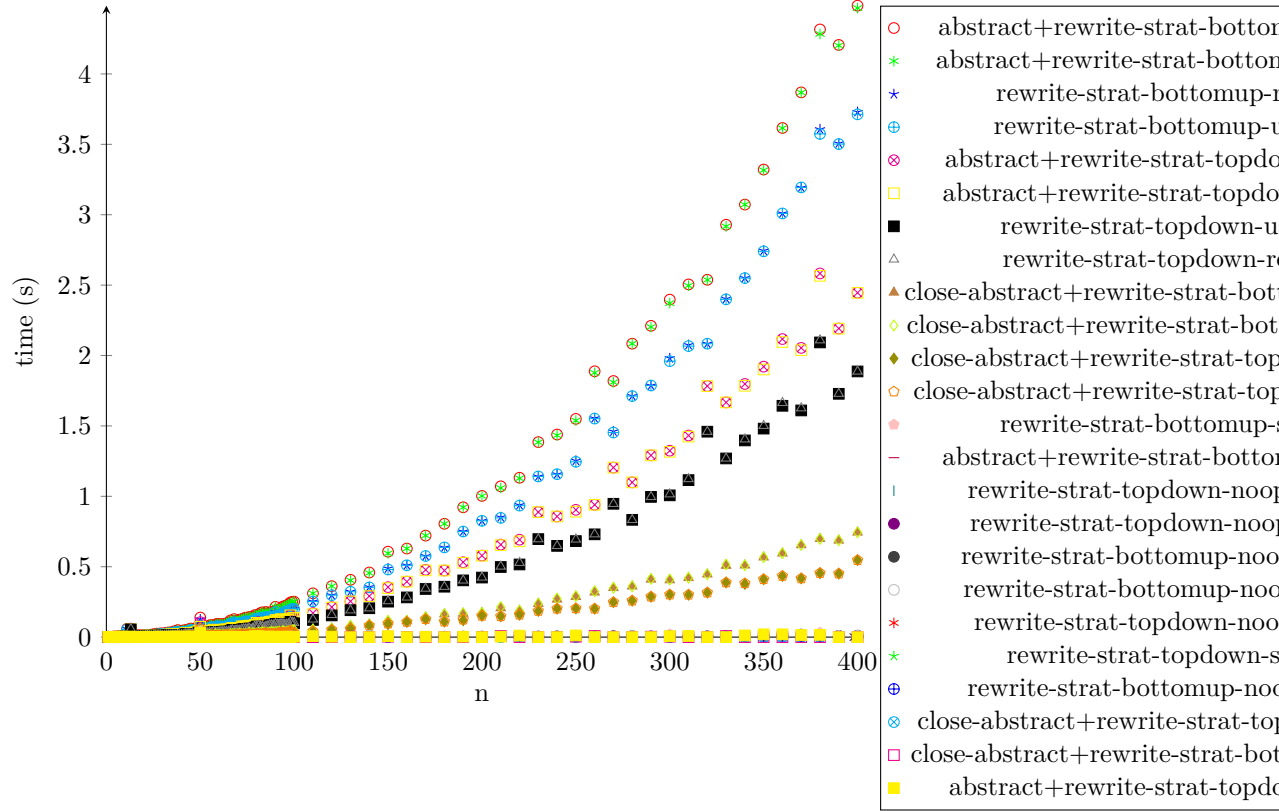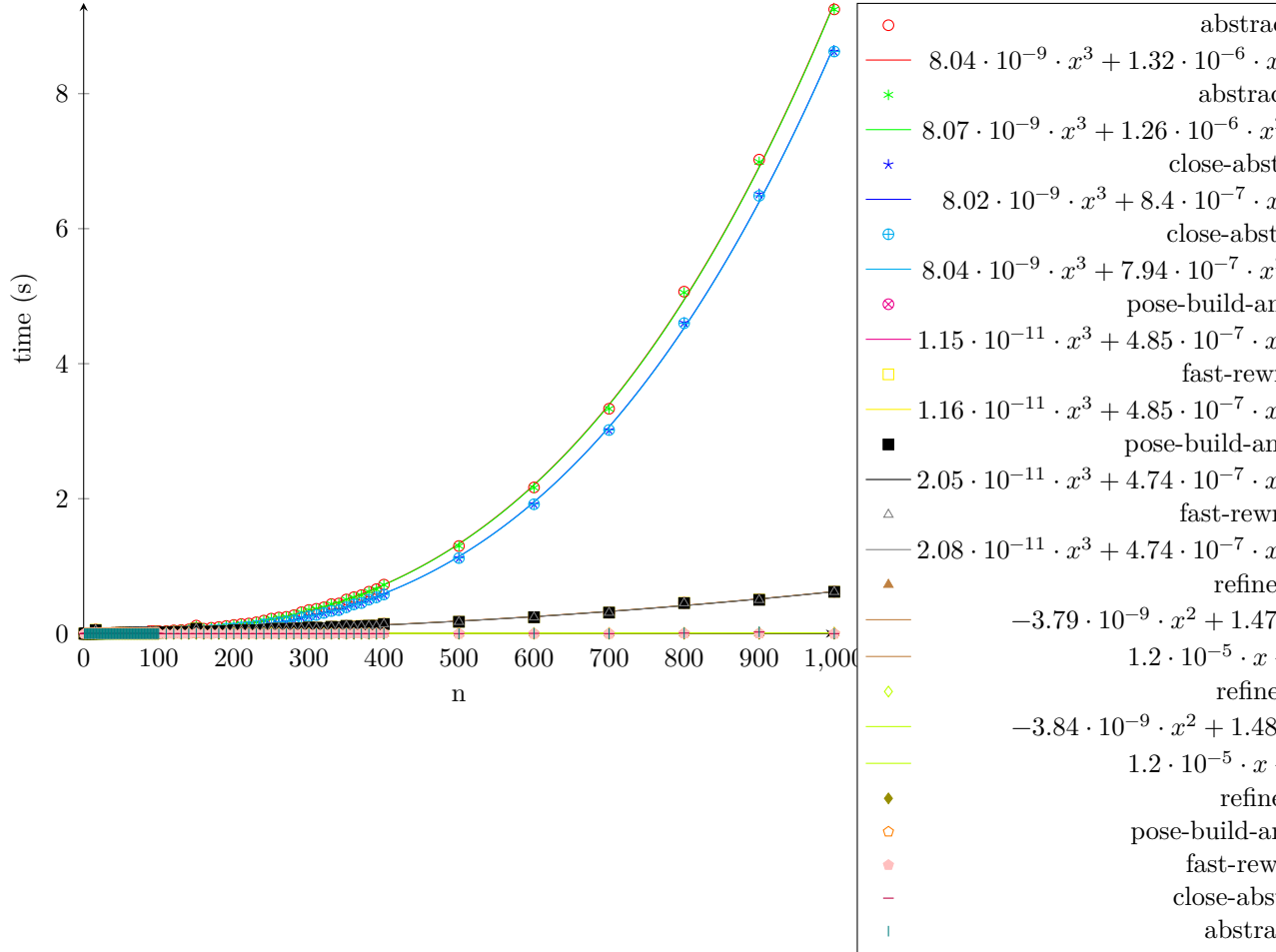
Figure 10: timing-rewrite-repeated-app-rewrite-strat

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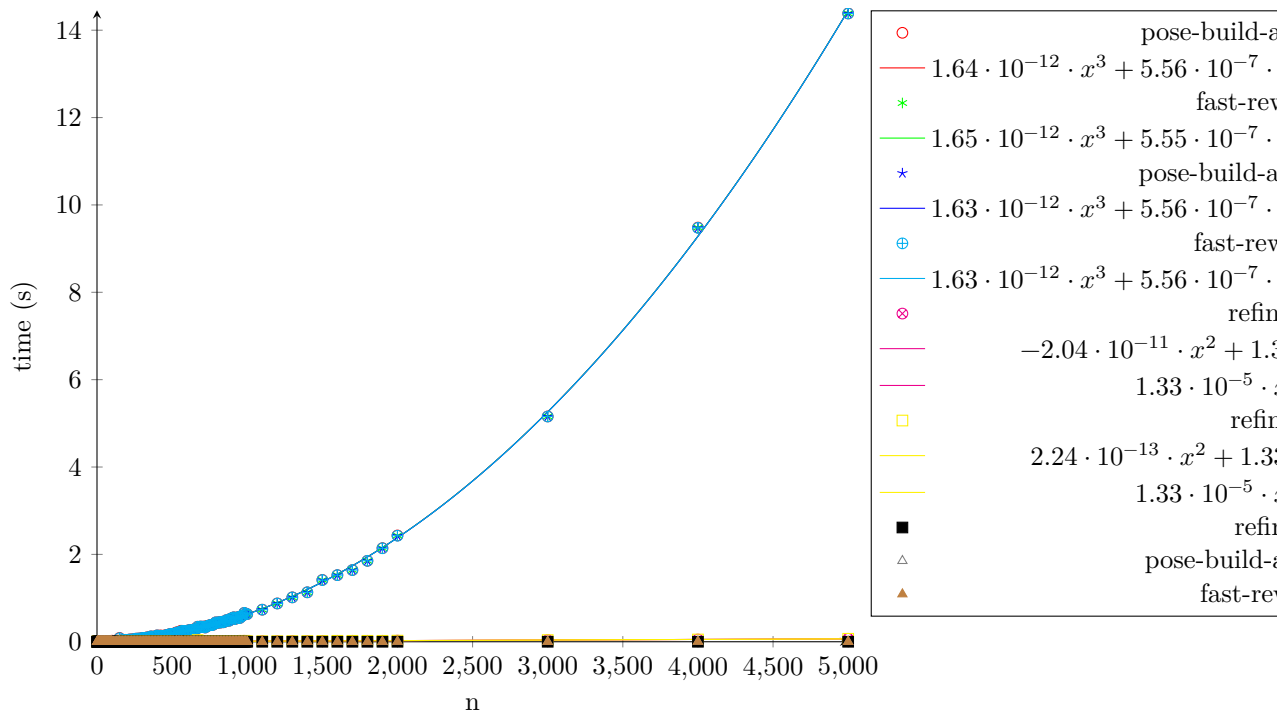
11

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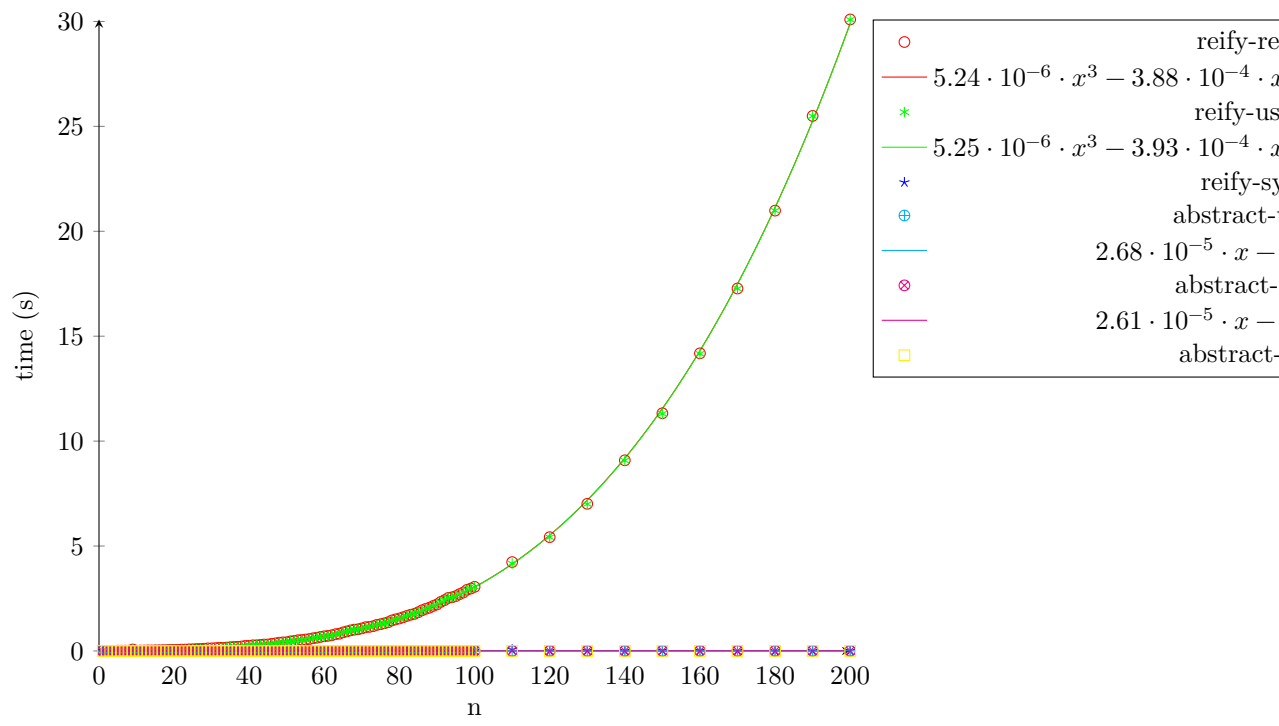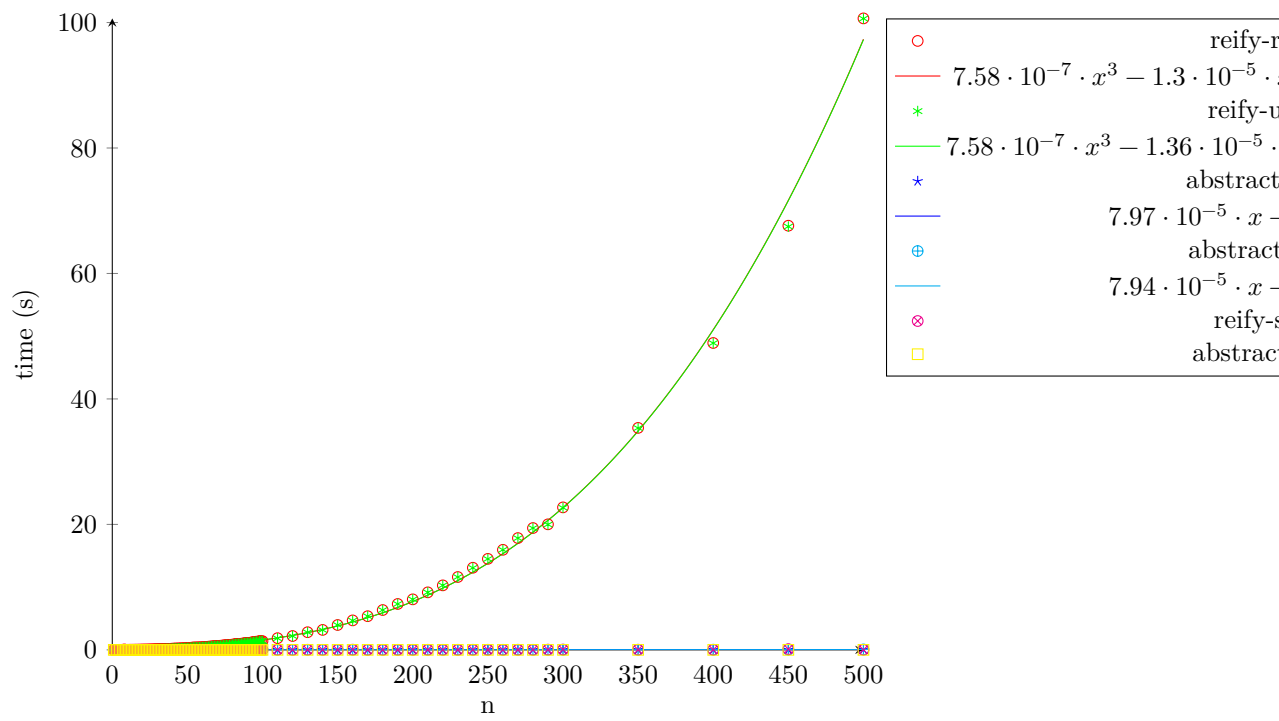
Figure 13: timing-typeclass-reification-let-in-HOAS

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