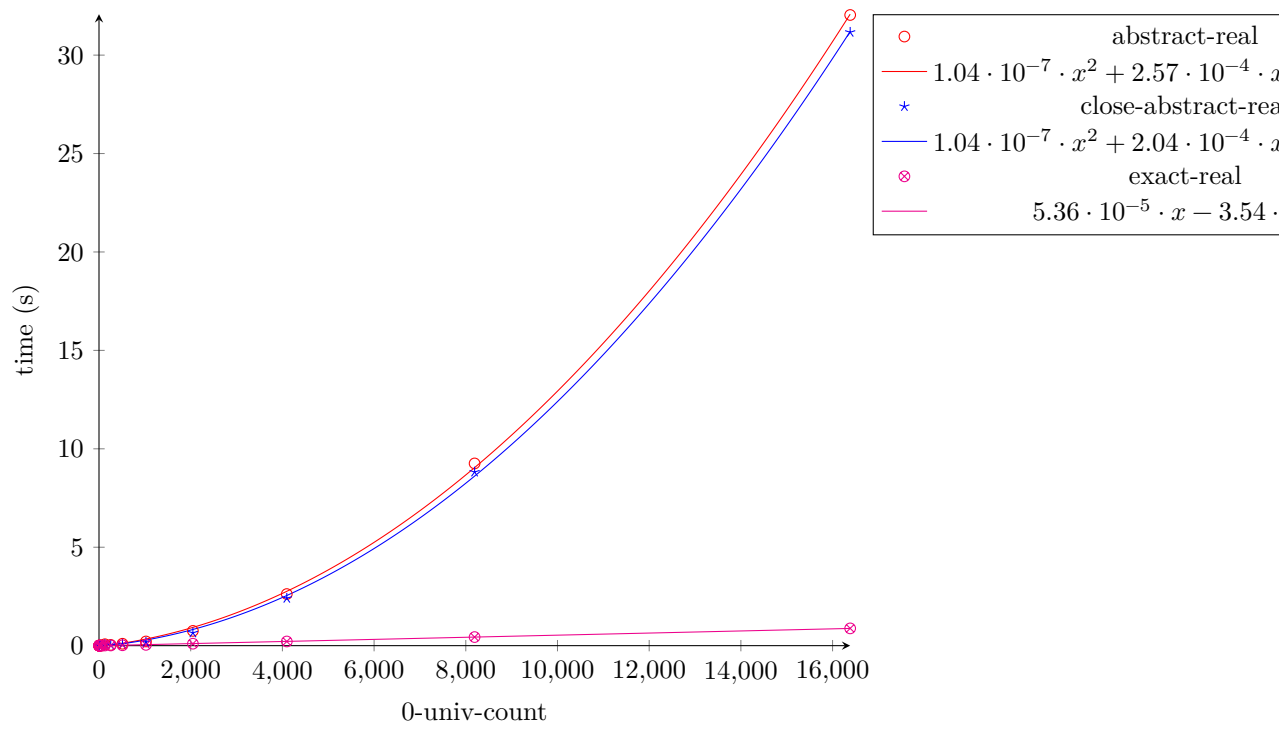Figure 1: timing-pattern

1

Figure 2: timing-n-polymorphic-universes param-1-n 0
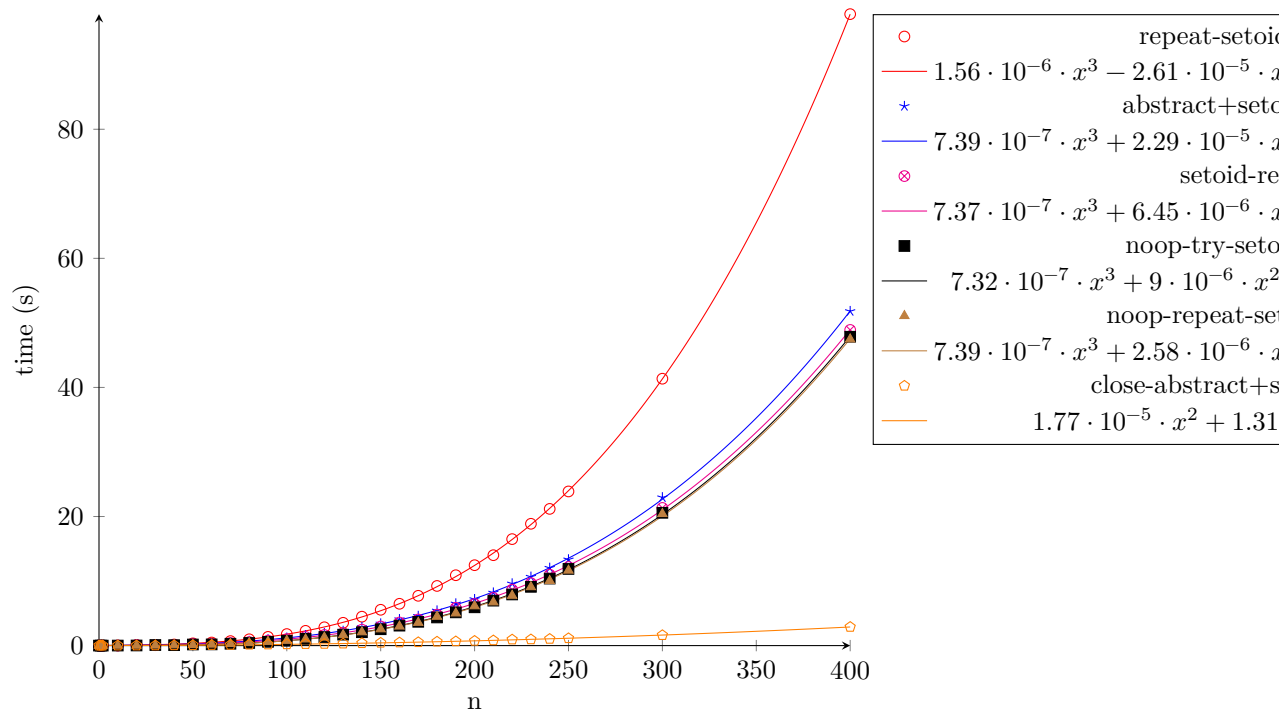
Figure 3: timing-repeat-setoid-rewrite-under-binders
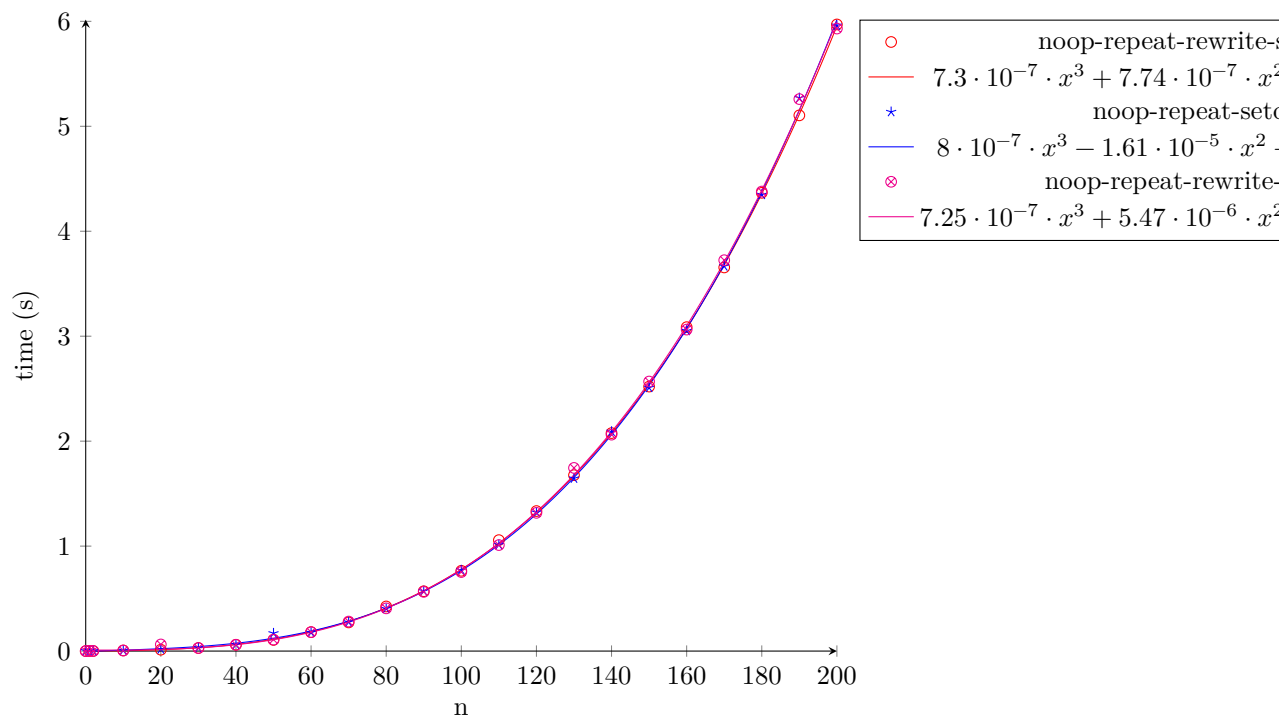
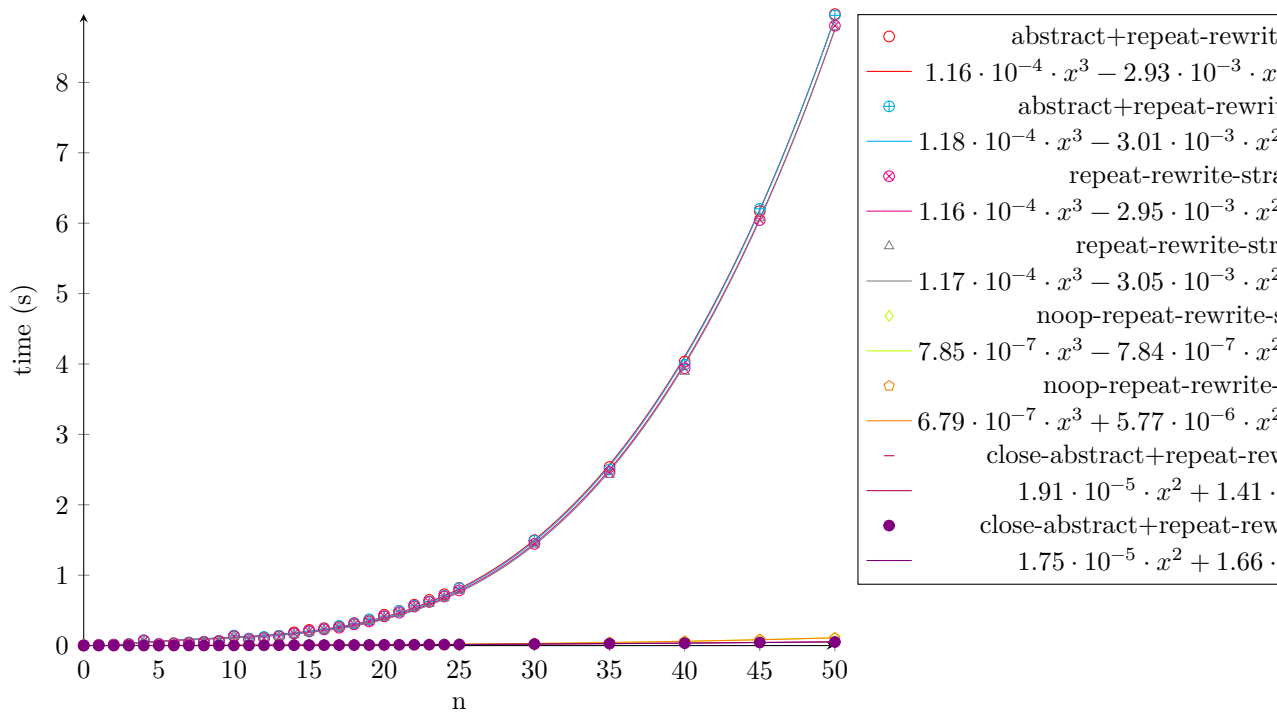Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

time (s)

n

abstract+repeat-rewrit

$1.16 \cdot 10^{-4} \cdot x^3 - 2.93 \cdot 10^{-3} \cdot x$

abstract+repeat-rewri

$1.18 \cdot 10^{-4} \cdot x^3 - 3.01 \cdot 10^{-3} \cdot x^2$

repeat-rewrite-str

$1.16 \cdot 10^{-4} \cdot x^3 - 2.95 \cdot 10^{-3} \cdot x^2$

repeat-rewrite-str

$1.17 \cdot 10^{-4} \cdot x^3 - 3.05 \cdot 10^{-3} \cdot x^2$

noop-repeat-rewrite-

$7.85 \cdot 10^{-7} \cdot x^3 - 7.84 \cdot 10^{-7} \cdot x^2$

noop-repeat-rewrite-

$6.79 \cdot 10^{-7} \cdot x^3 + 5.77 \cdot 10^{-6} \cdot x^2$

close-abstract+repeat-rew

$1.91 \cdot 10^{-5} \cdot x^2 + 1.41 \cdot$

close-abstract+repeat-rew

$1.75 \cdot 10^{-5} \cdot x^2 + 1.66 \cdot$

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

5
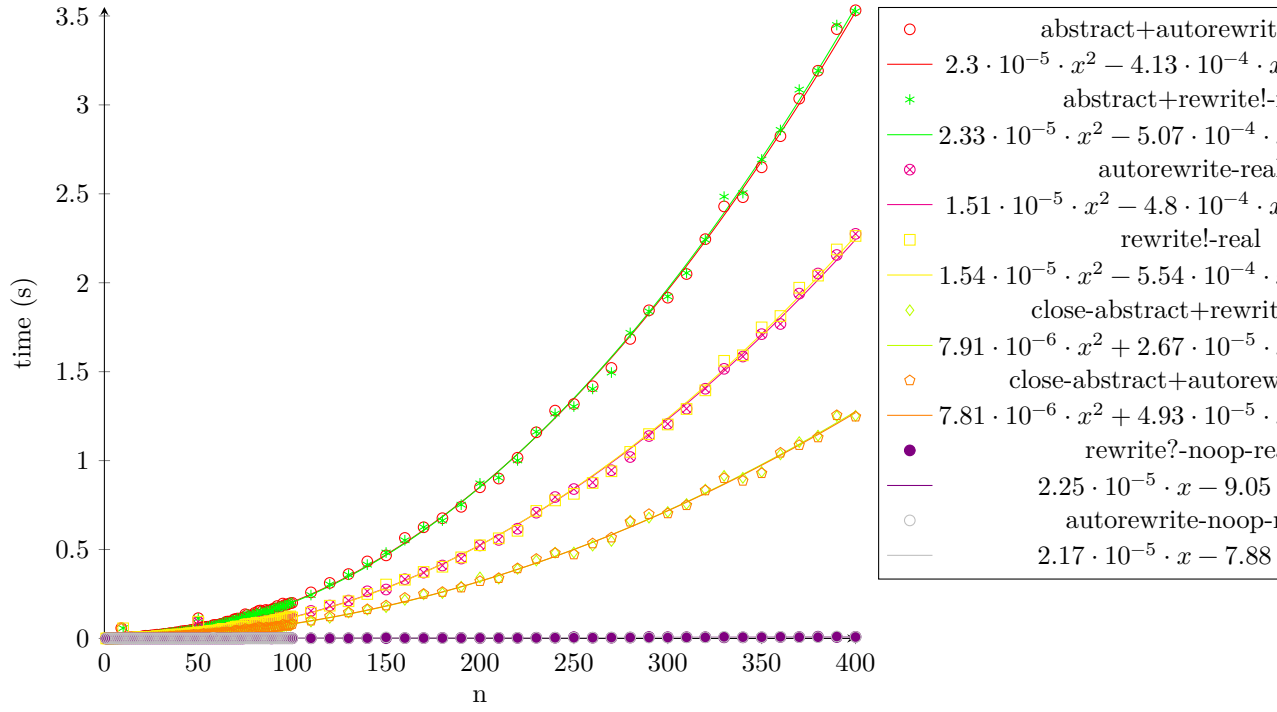
Figure 6: timing-rewrite-repeated-app-autorewrite

abstract+autorewrit
$2.3 \cdot 10^{-5} \cdot x^2 - 4.13 \cdot 10^{-4} \cdot$
abstract+rewrite!-
$2.33 \cdot 10^{-5} \cdot x^2 - 5.07 \cdot 10^{-4} \cdot$
autorewrite-rea
$1.51 \cdot 10^{-5} \cdot x^2 - 4.8 \cdot 10^{-4} \cdot$
rewrite!-real
$1.54 \cdot 10^{-5} \cdot x^2 - 5.54 \cdot 10^{-4} \cdot$
close-abstract+rewrit
$7.91 \cdot 10^{-6} \cdot x^2 + 2.67 \cdot 10^{-5} \cdot$
close-abstract+autorew
$7.81 \cdot 10^{-6} \cdot x^2 + 4.93 \cdot 10^{-5} \cdot$
rewrite?-noop-re
$2.25 \cdot 10^{-5} \cdot x - 9.05$
autorewrite-noop-
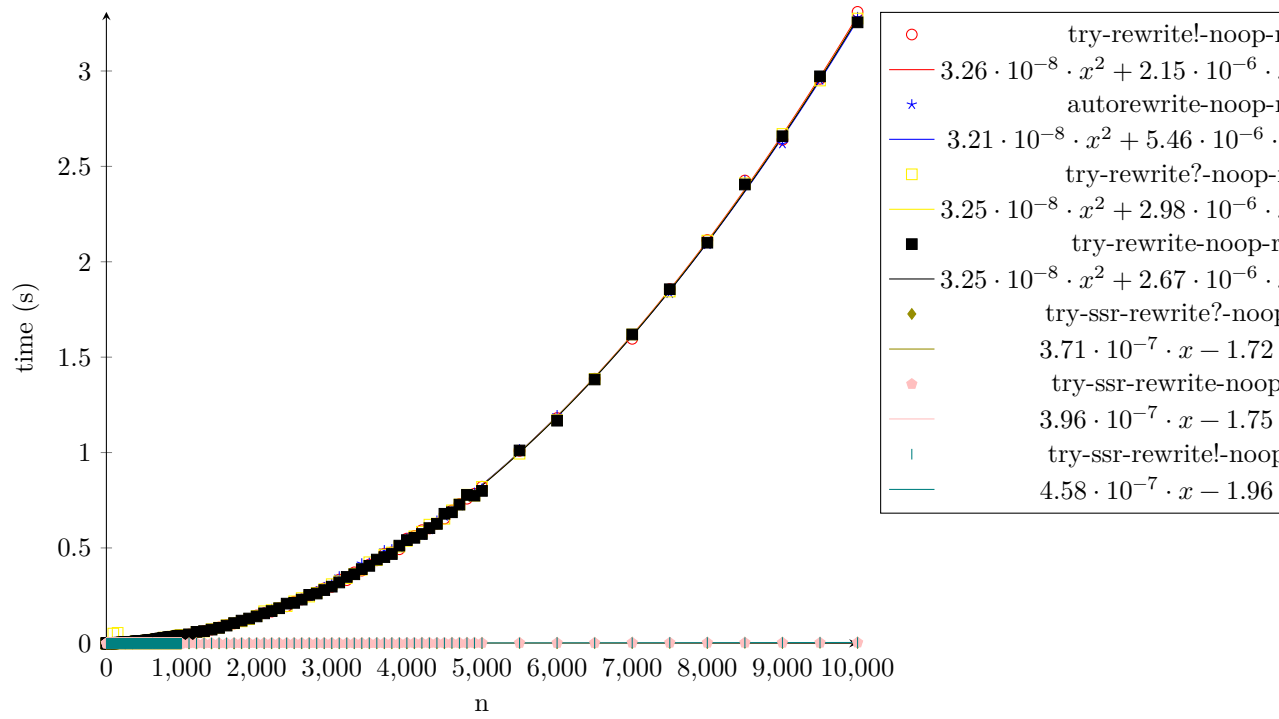$2.17 \cdot 10^{-5} \cdot x - 7.88$

6

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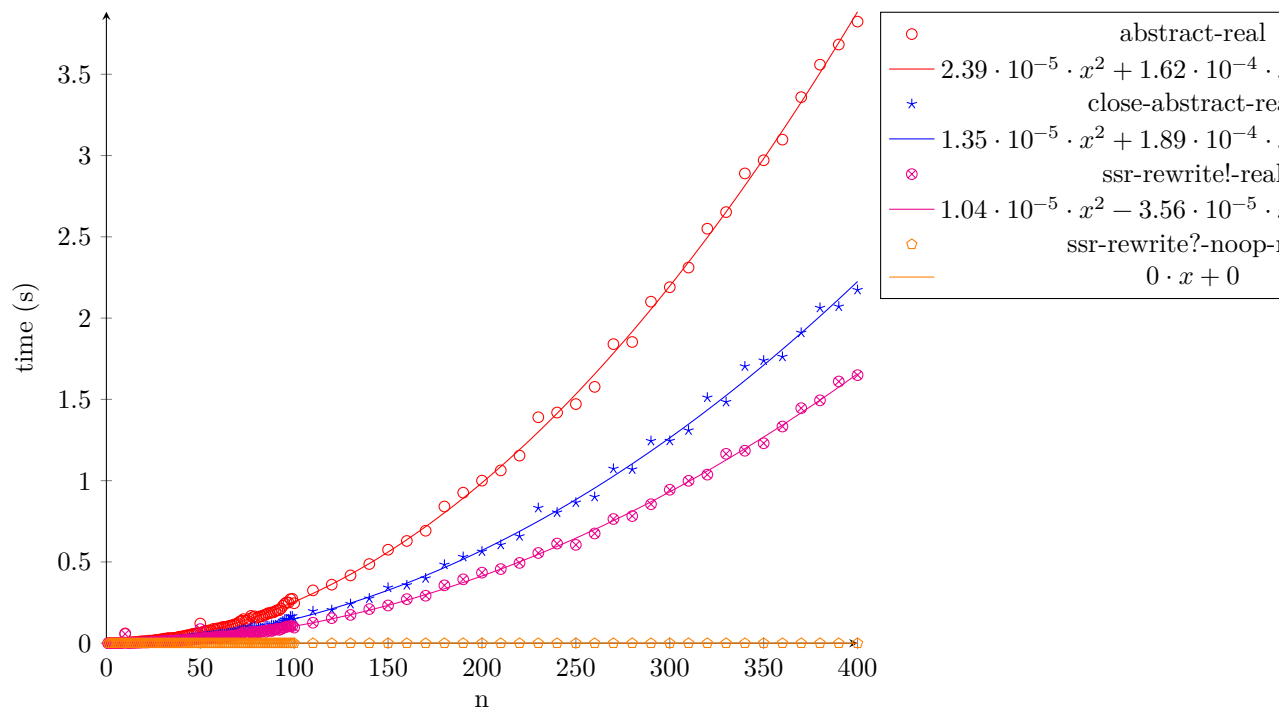
7

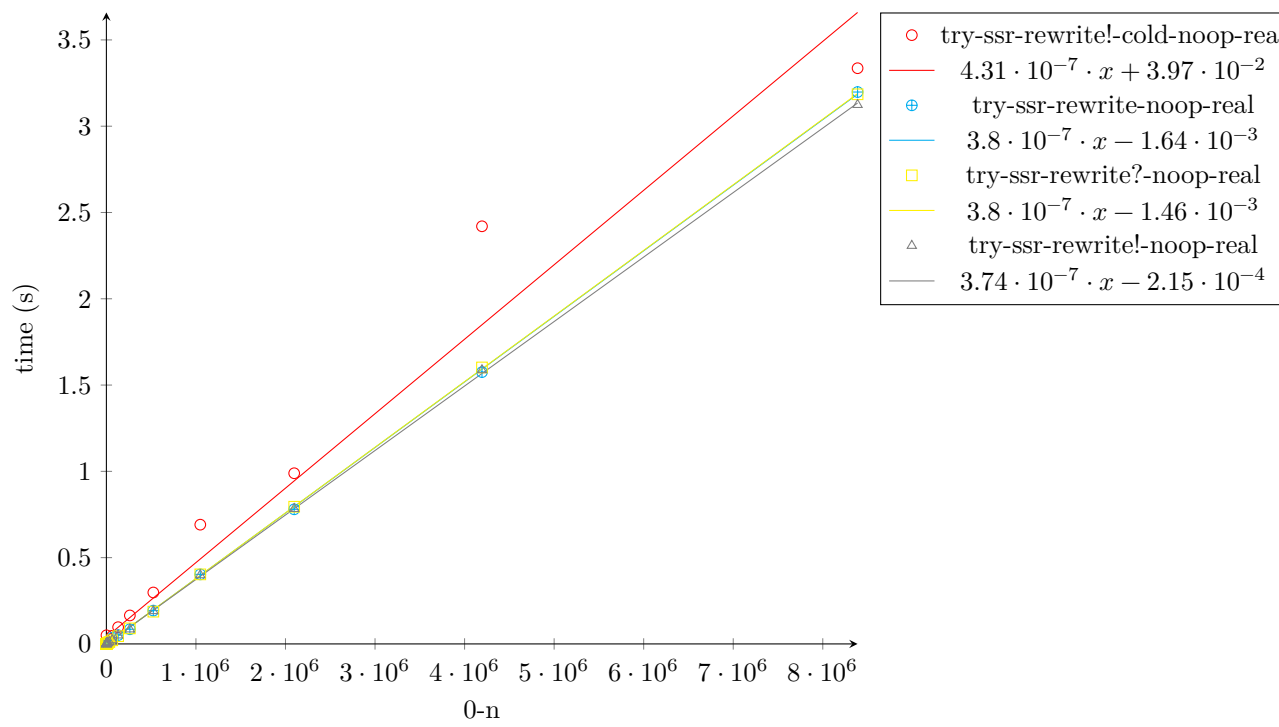Figure 8: timing-rewrite-repeated-app-ssrrewrite

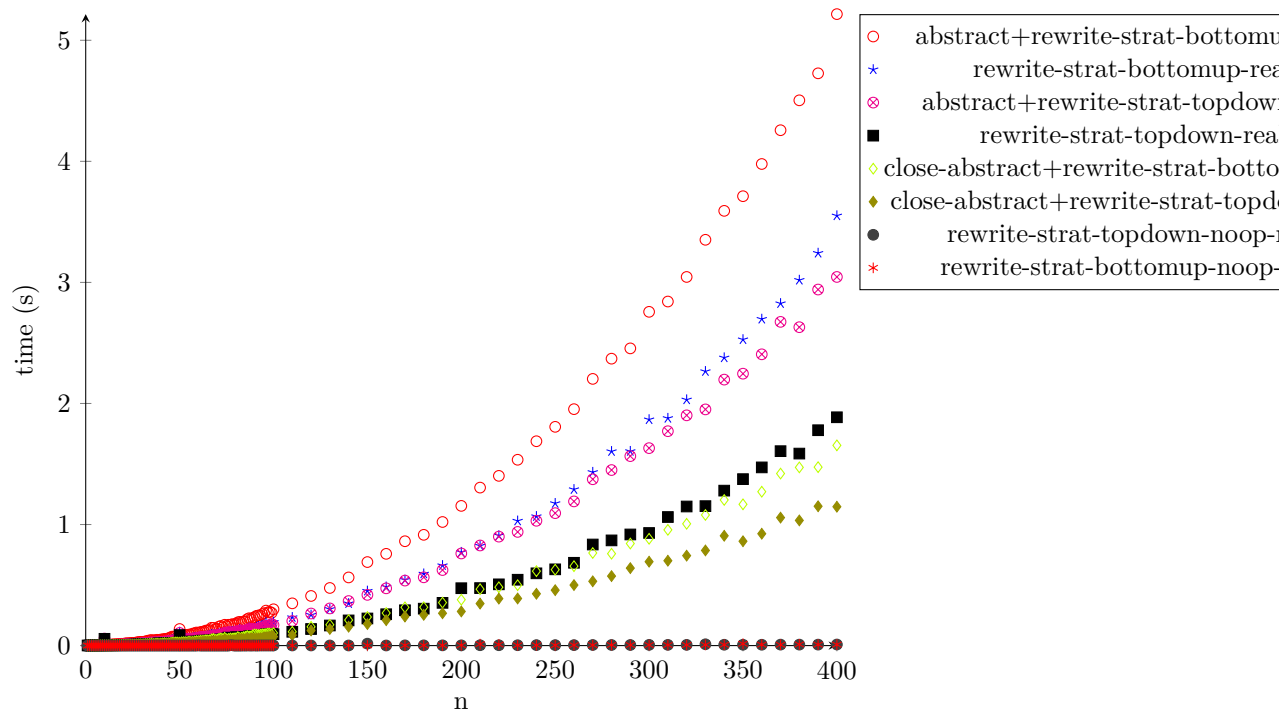Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

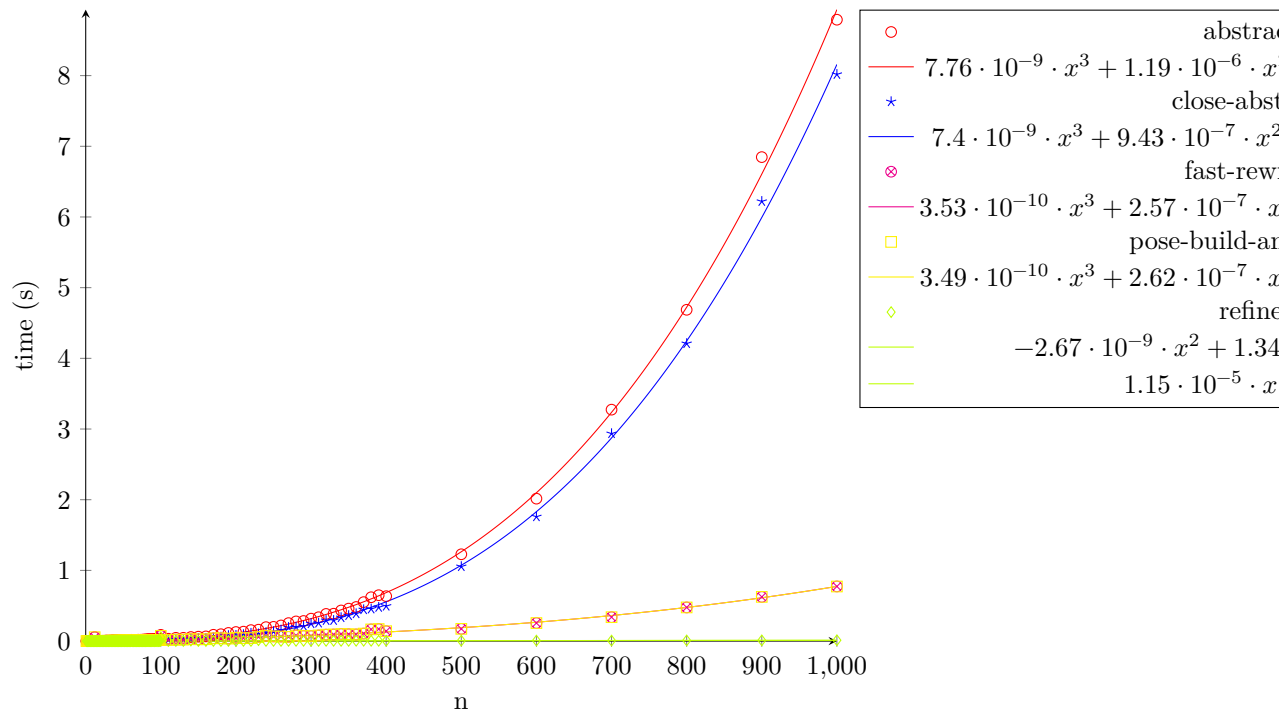Figure 10: timing-rewrite-repeated-app-rewrite-strat

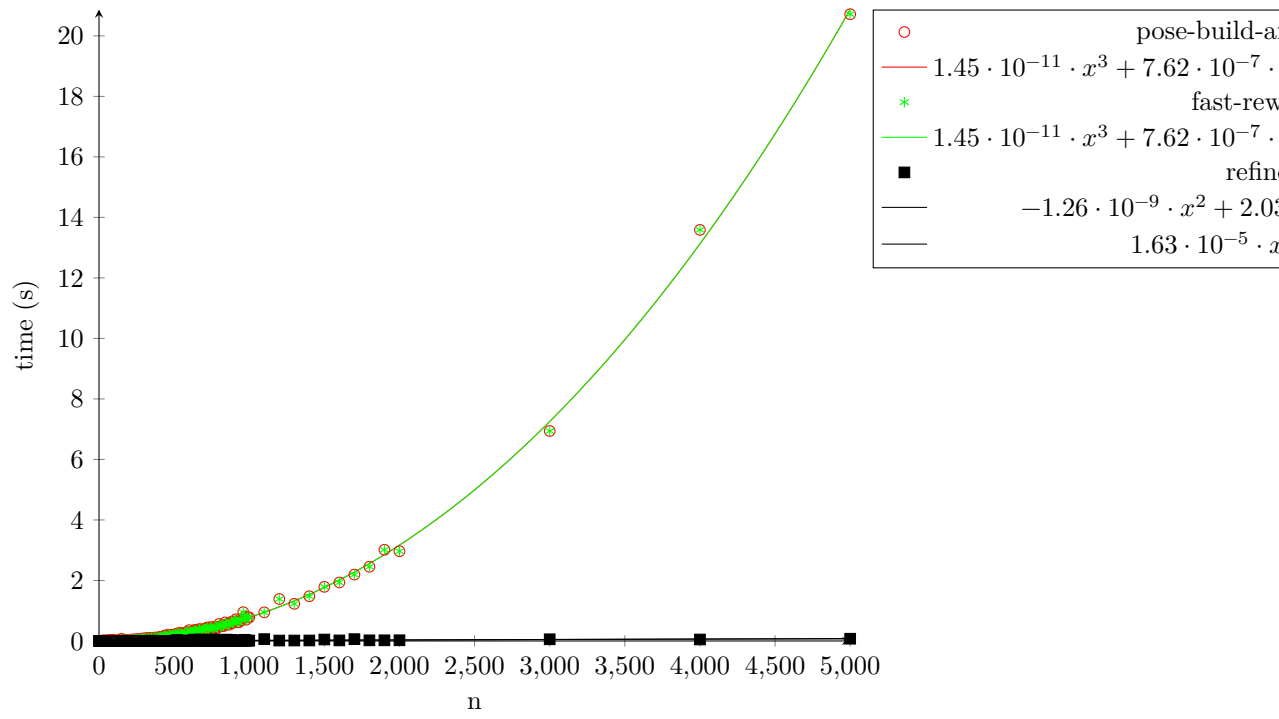Figure 11: timing-rewrite-repeated-app-fast-rewrite

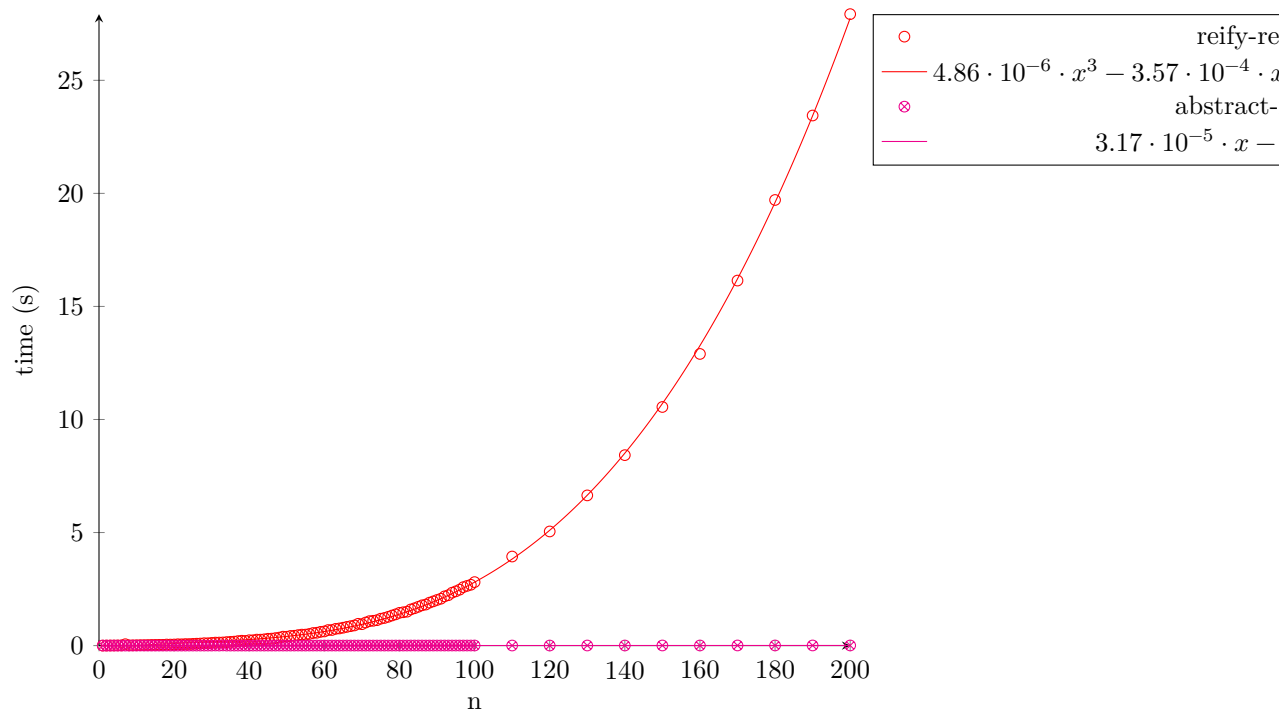Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract

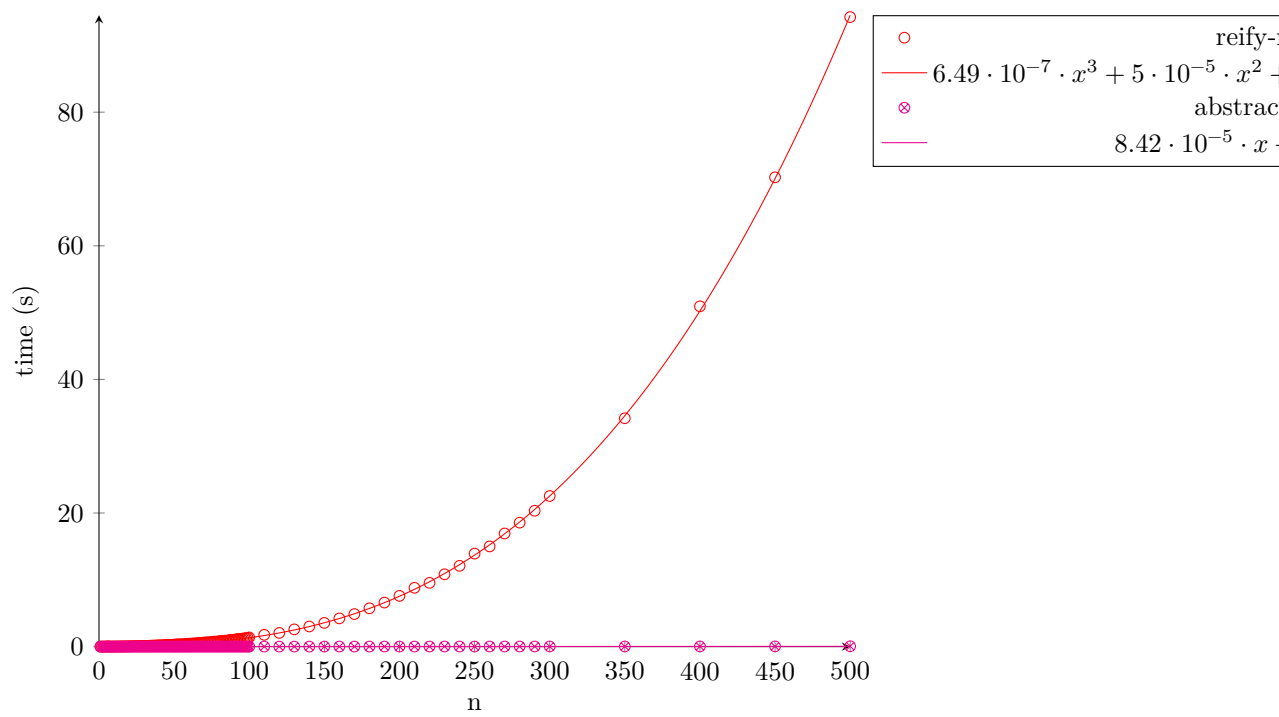Figure 13: timing-typeclass-reification-let-in-HOAS

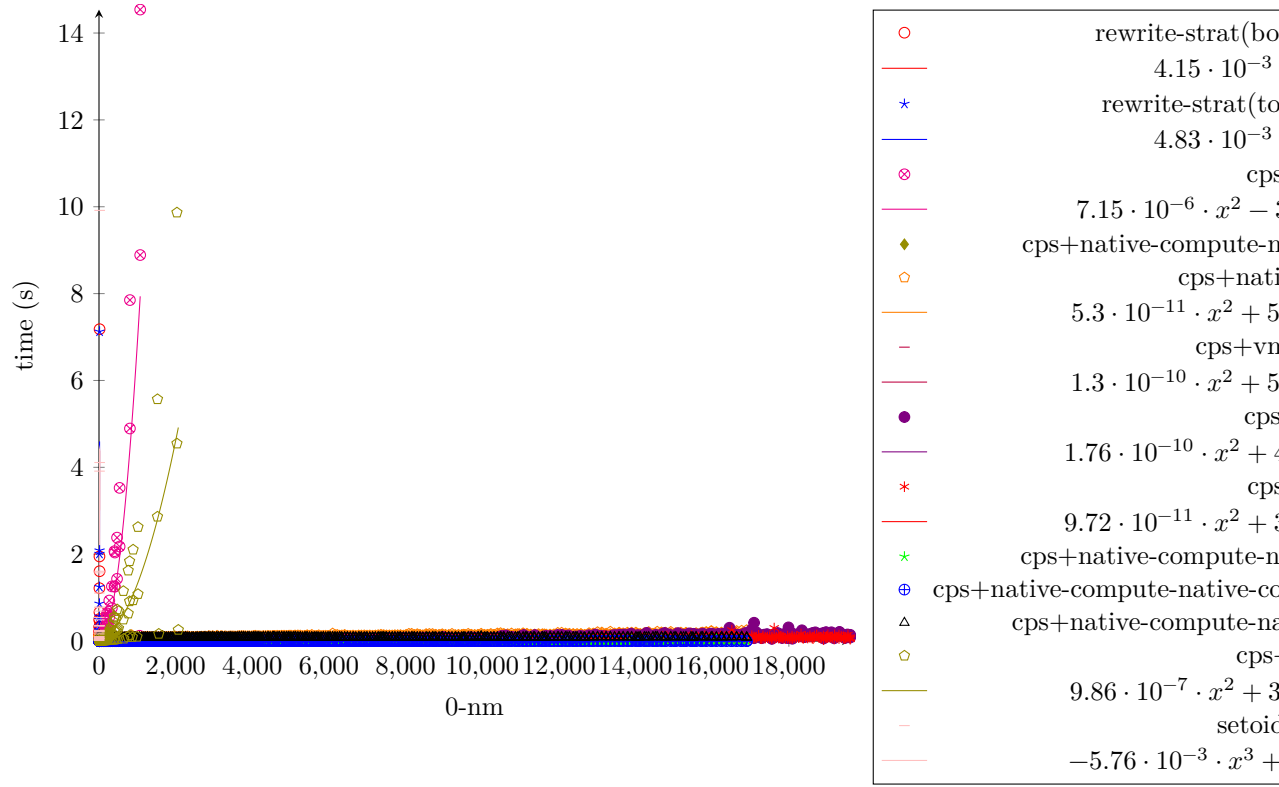Figure 14: timing-typeclass-reification-let-in-PHOAS

Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1
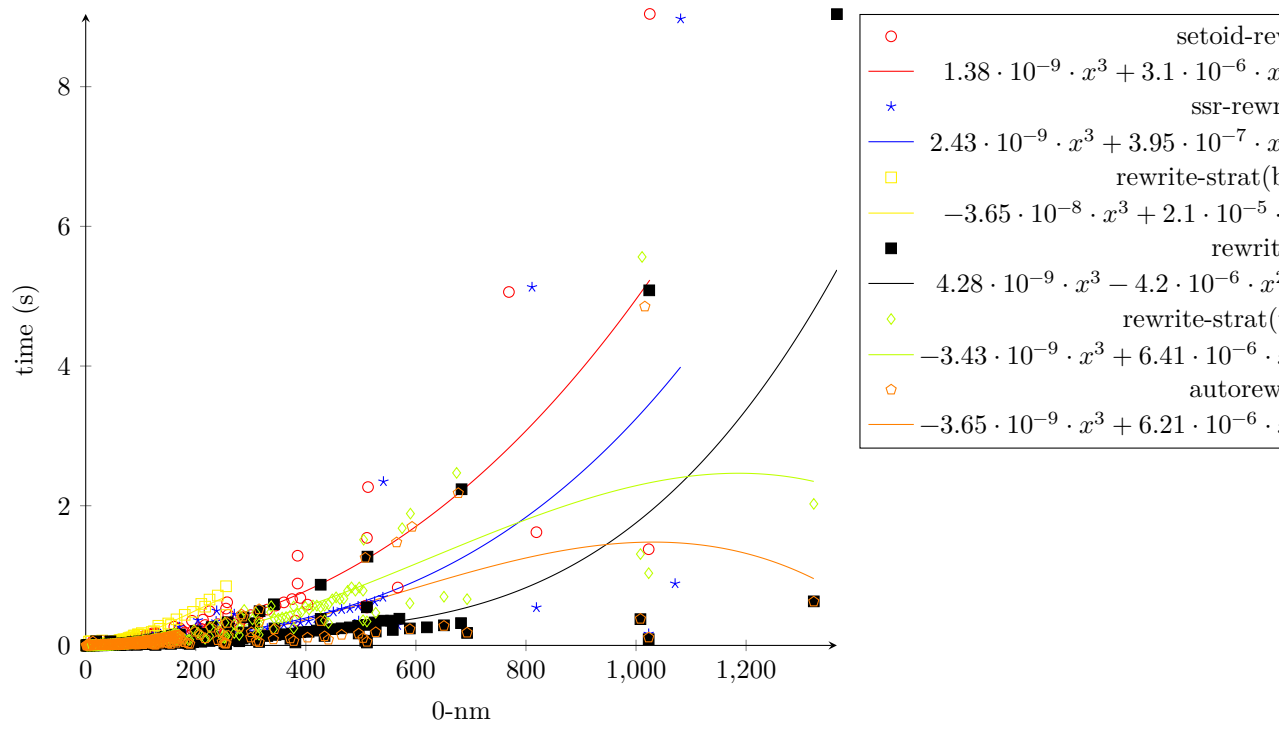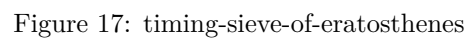
15

Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1
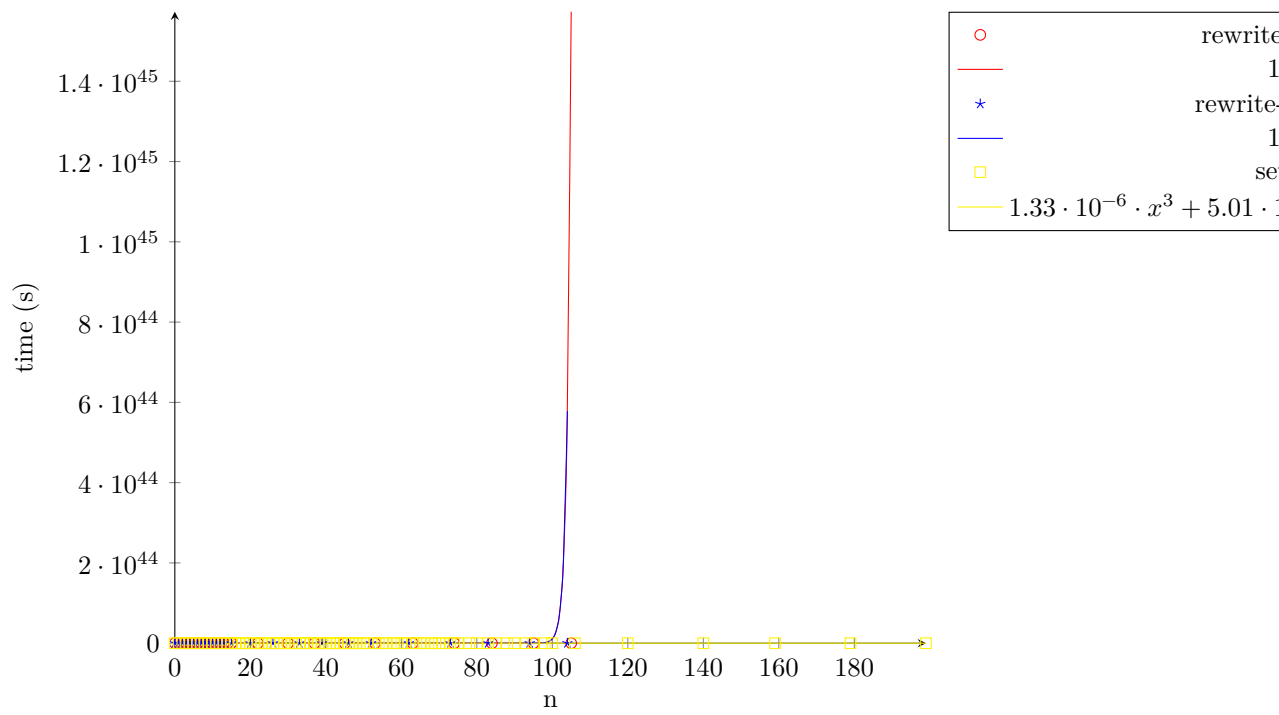
16

Figure 17: timing-sieve-of-eratosthenes

Figure 18: timing-rewrite-under-lets-plus-0

time (s)

n

abstract-real

$2.22 \cdot 10^{-6} \cdot x^2 - 1.28 \cdot 10^{-3}$

fast-rewrite-real

$1.99 \cdot 10^{-6} \cdot x^2 - 1.32 \cdot 10^{-3}$

type-pf-cast-real

$3.2 \cdot 10^{-7} \cdot x^2 - 2.68 \cdot 10^{-4} \cdot x$

refine-real

$3.2 \cdot 10^{-7} \cdot x^2 - 2.52 \cdot 10^{-4} \cdot x$

$4.12 \cdot 10^{-4} \cdot x - 5.05$

check-admit-real

$2.69 \cdot 10^{-7} \cdot x^2 - 2.07 \cdot 10^{-4} \cdot x$

check-admit-cast-re

$3.24 \cdot 10^{-7} \cdot x^2 - 2.77 \cdot 10^{-4} \cdot x$

type-admit-cast-re

$3.16 \cdot 10^{-7} \cdot x^2 - 2.48 \cdot 10^{-4} \cdot x$

type-admit-real

$3.19 \cdot 10^{-7} \cdot x^2 - 2.56 \cdot 10^{-4} \cdot x$

close-abstract-rea

$2.3 \cdot 10^{-7} \cdot x^2 + 3.35 \cdot 10^{-5} \cdot x$

check-pf-cast-rea

$1.18 \cdot 10^{-7} \cdot x^2 + 5.42 \cdot 10^{-5} \cdot x$

build-eval-thunk-re

$8.85 \cdot 10^{-5} \cdot x + 1.4$

build-thunk-real

$8.78 \cdot 10^{-5} \cdot x + 7.1$

type-I-real

$1.59 \cdot 10^{-5} \cdot x - 4.03$

check-I-real

$1.49 \cdot 10^{-5} \cdot x - 3.53$

build-admit-real

$7.14 \cdot 10^{-6} \cdot x - 4.92$

build-pf-cast-real

$6.22 \cdot 10^{-6} \cdot x - 3.63$

build-admit-cast-re

$6.14 \cdot 10^{-6} \cdot x - 3.47$

build-I-real

$6.39 \cdot 10^{-6} \cdot x - 2.72$
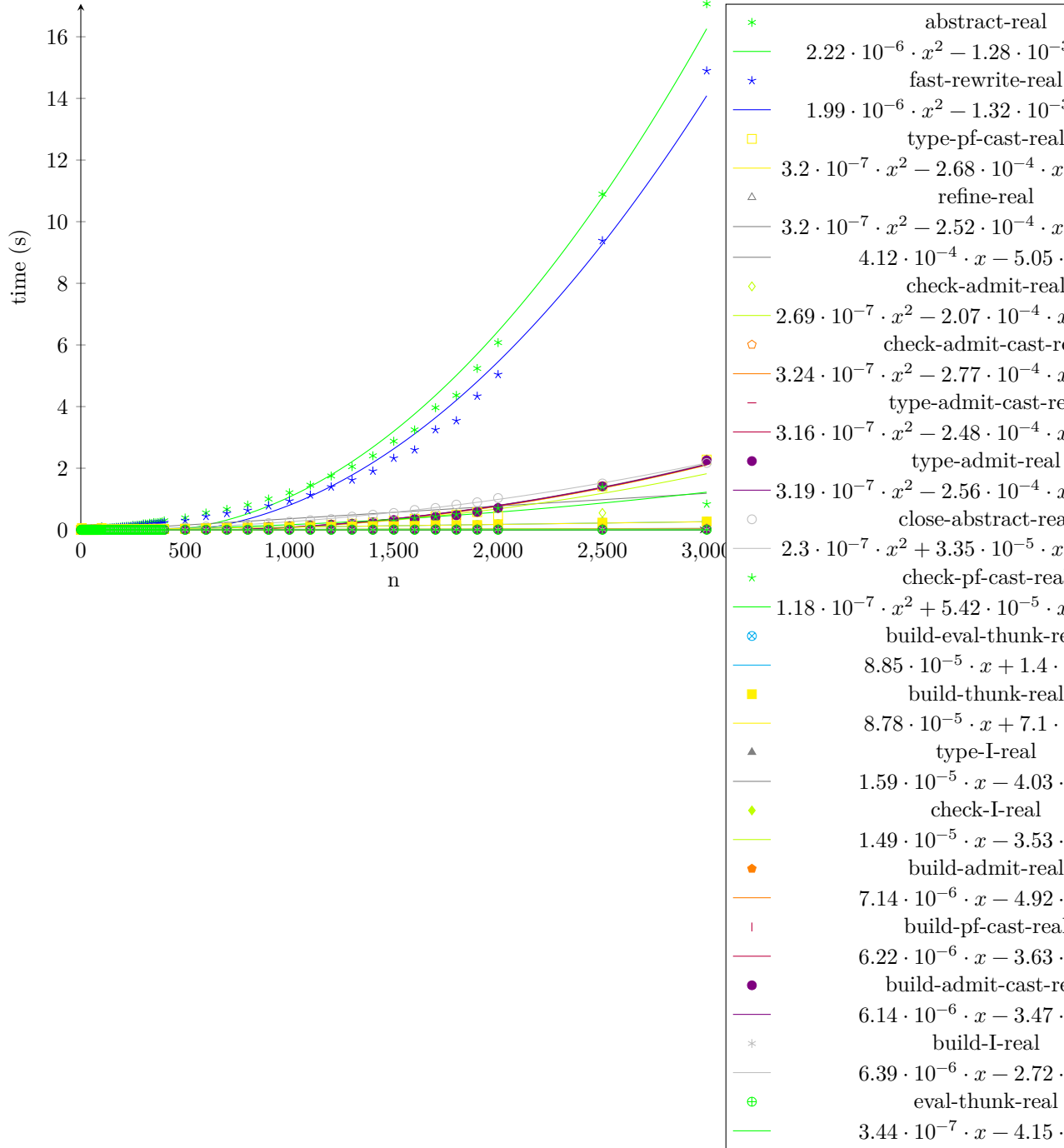
eval-thunk-real

$3.44 \cdot 10^{-7} \cdot x - 4.15$

Figure 19: timing-rewrite-repeated-app-fast-rewrite-ltac2