Figure 1: timing-pattern

1

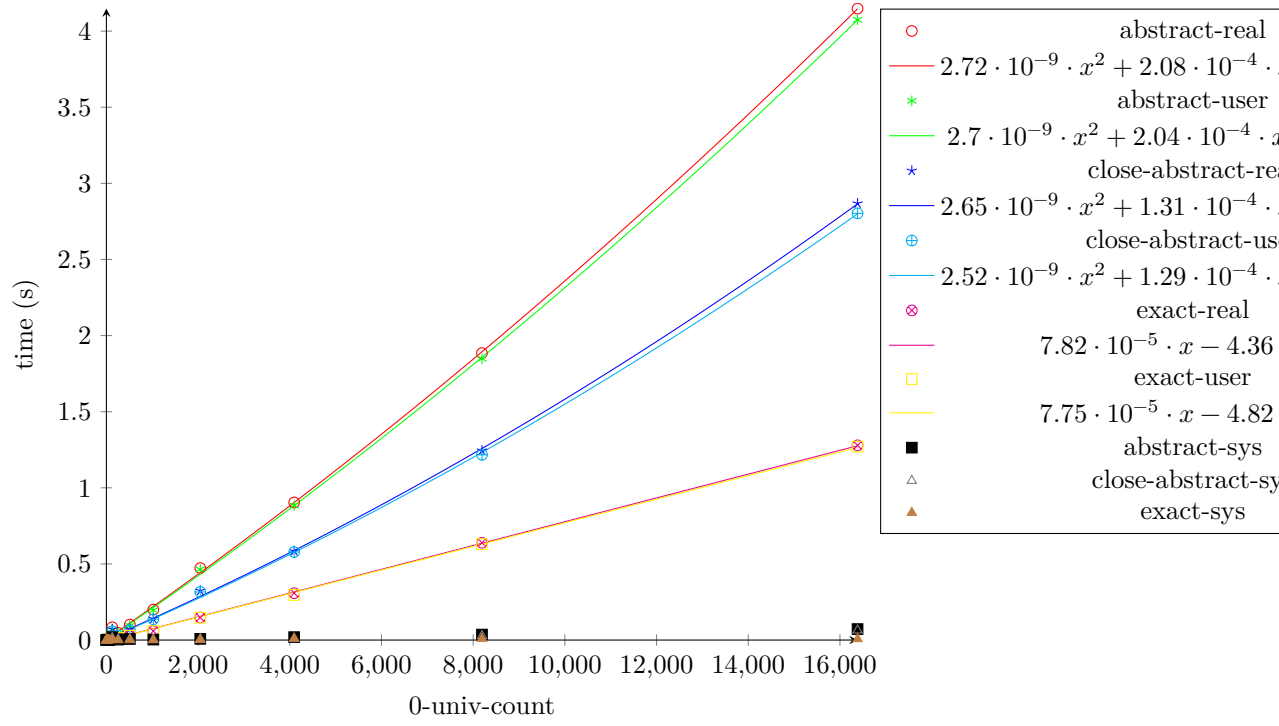|	abstract-real
○ (red circle)	abstract-real
— (red line)	$2.72 \cdot 10^{-9} \cdot x^2 + 2.08 \cdot 10^{-4} \cdot$
✶ (green)	abstract-user
— (green line)	$2.7 \cdot 10^{-9} \cdot x^2 + 2.04 \cdot 10^{-4} \cdot x$
✶ (blue)	close-abstract-re
— (blue line)	$2.65 \cdot 10^{-9} \cdot x^2 + 1.31 \cdot 10^{-4} \cdot$
⊕ (cyan)	close-abstract-us
—	$2.52 \cdot 10^{-9} \cdot x^2 + 1.29 \cdot 10^{-4} \cdot$
⊗	exact-real
—	$7.82 \cdot 10^{-5} \cdot x - 4.36$
□ (yellow)	exact-user
— (yellow line)	$7.75 \cdot 10^{-5} \cdot x - 4.82$
■	abstract-sys
△	close-abstract-sy
▲	exact-sys

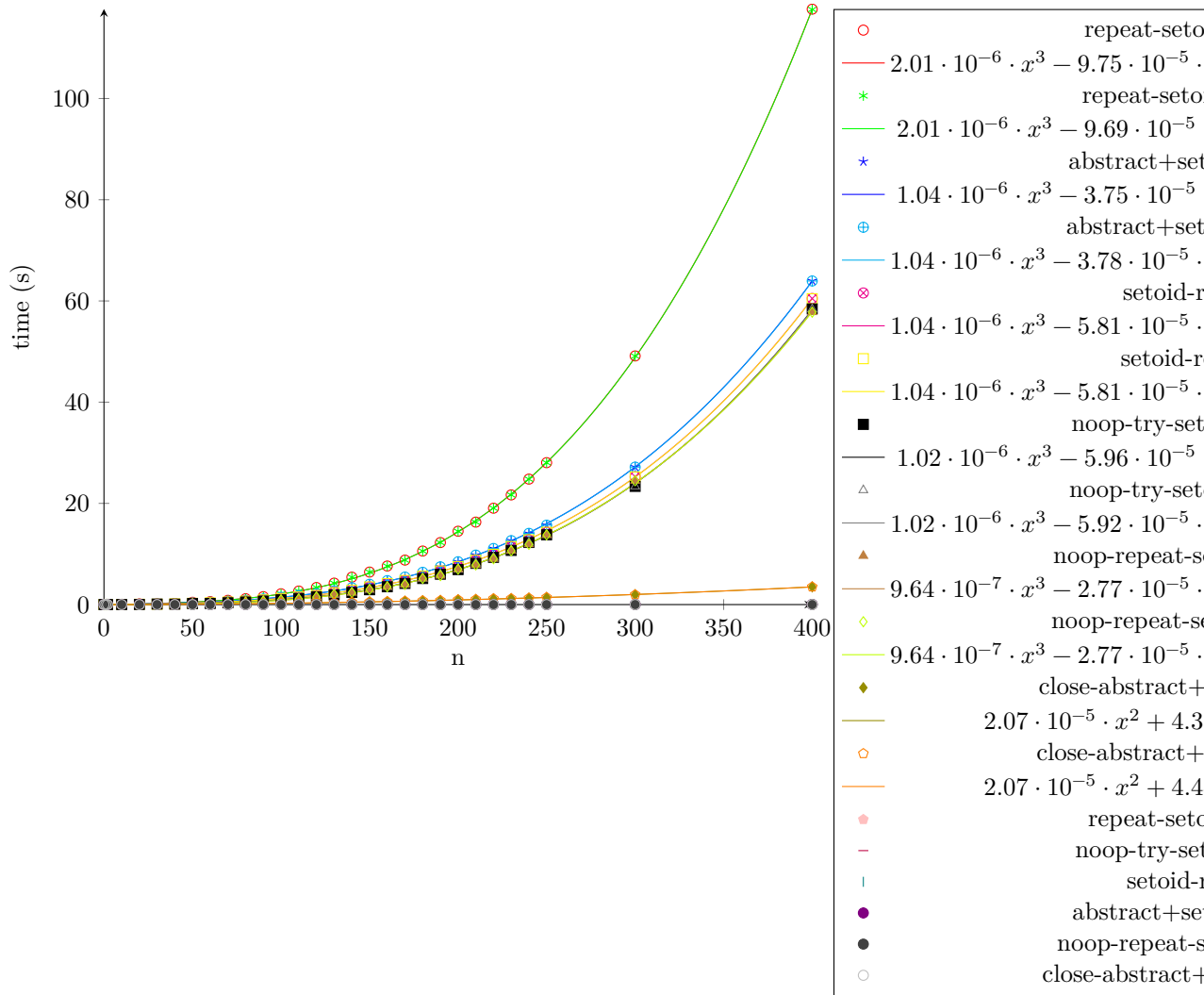Figure 2: timing-n-polymorphic-universes param-1-n 0

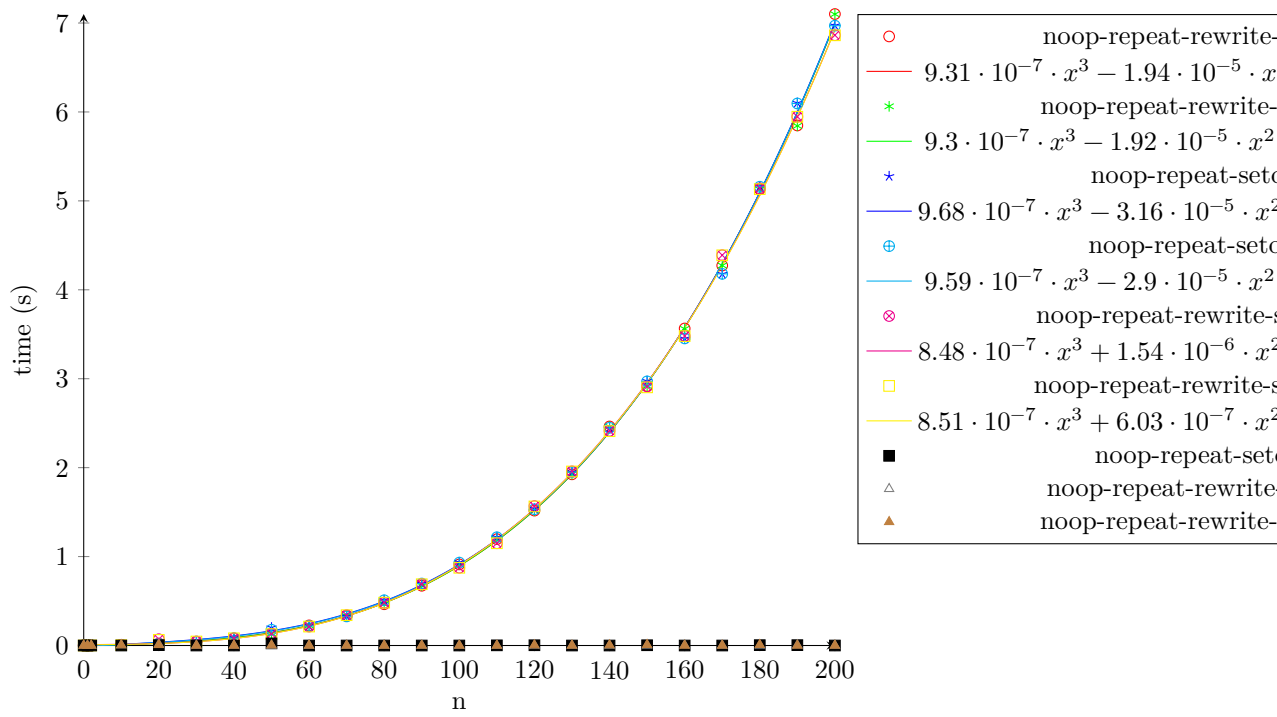Figure 3: timing-repeat-setoid-rewrite-under-binders

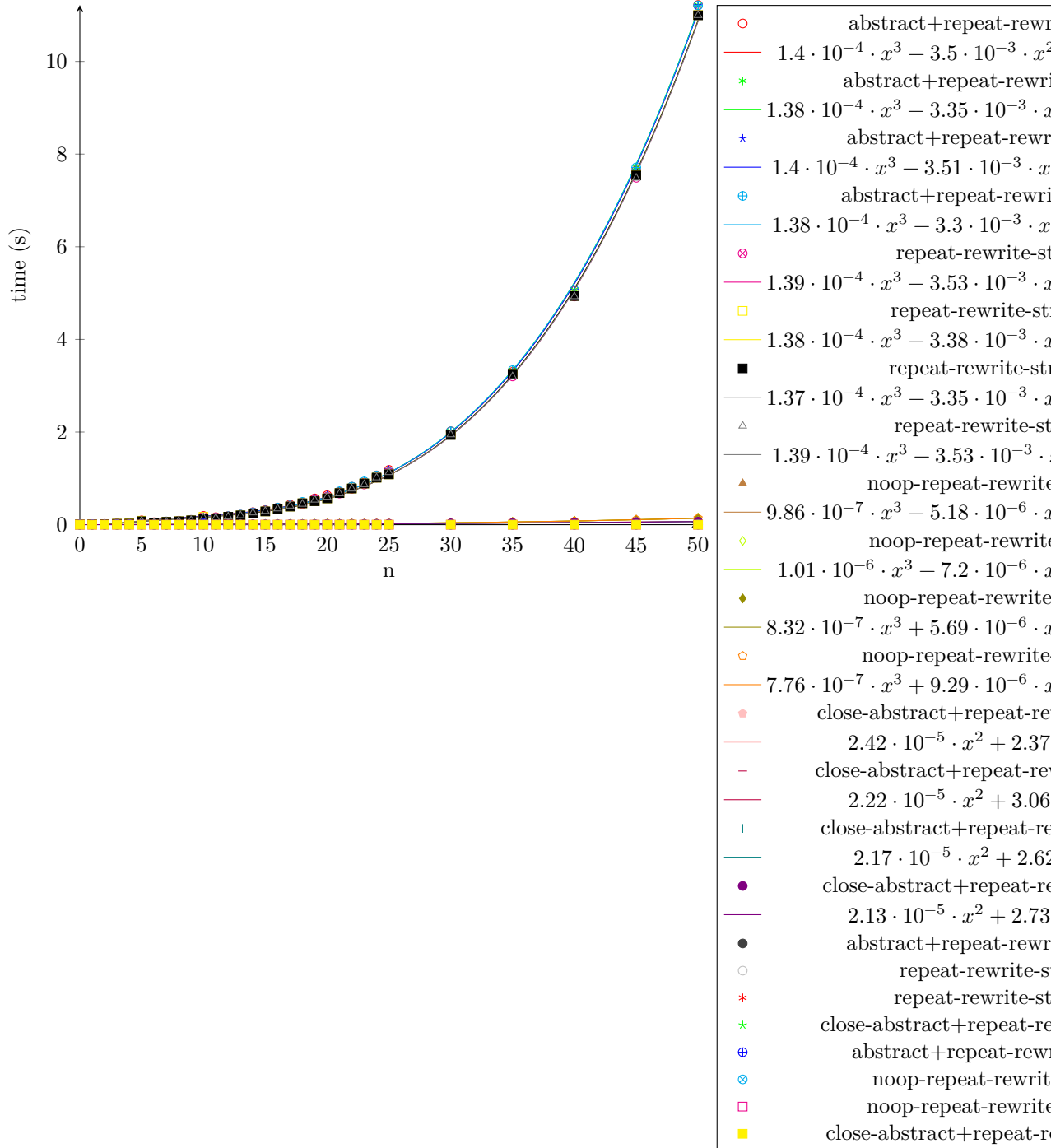Figure 4: timing-repeat-setoid-rewrite-under-binders-noop
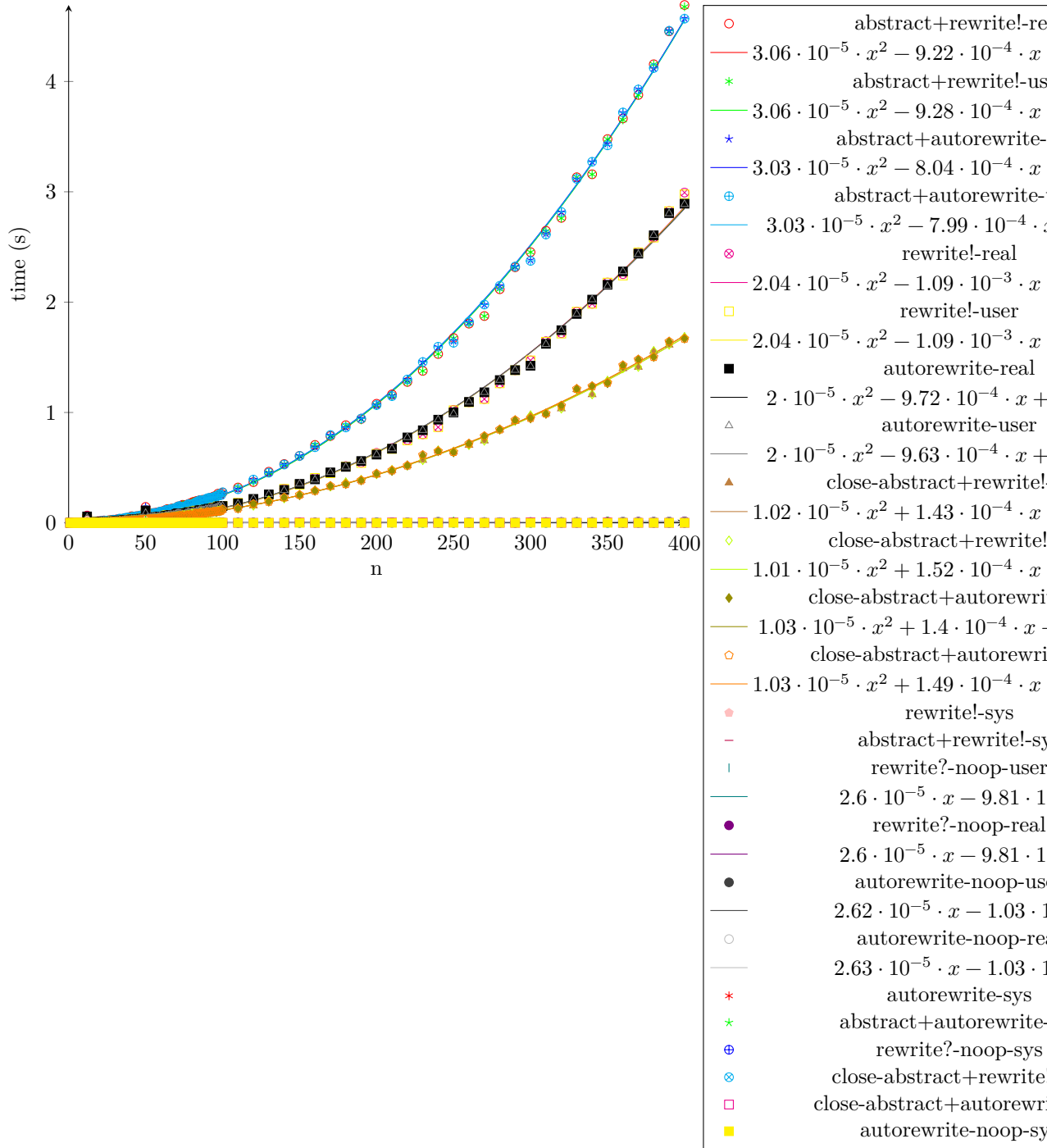
Figure 5: timing-rewrite-strat-under-binders
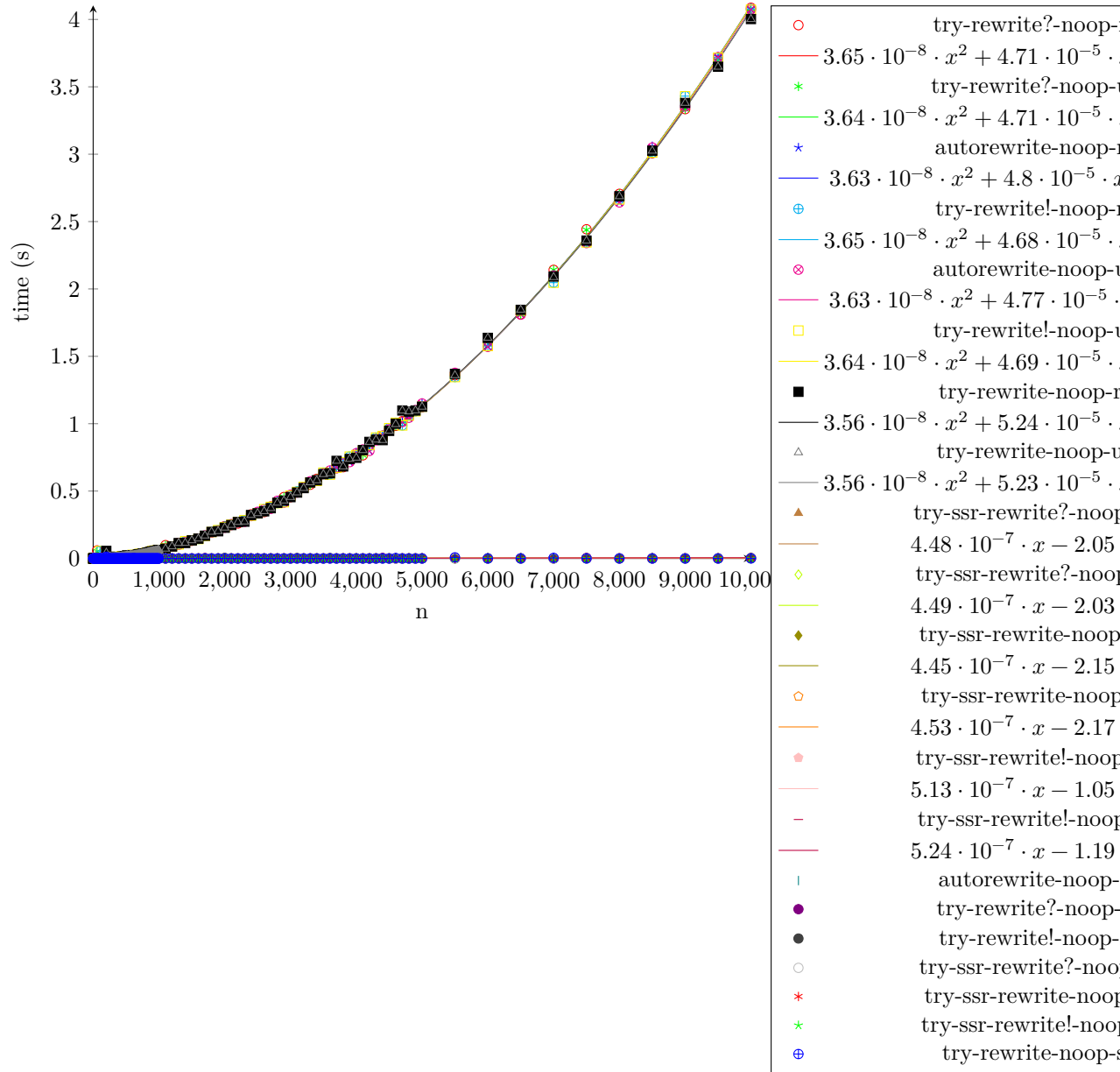
Figure 6: timing-rewrite-repeated-app-autorewrite

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

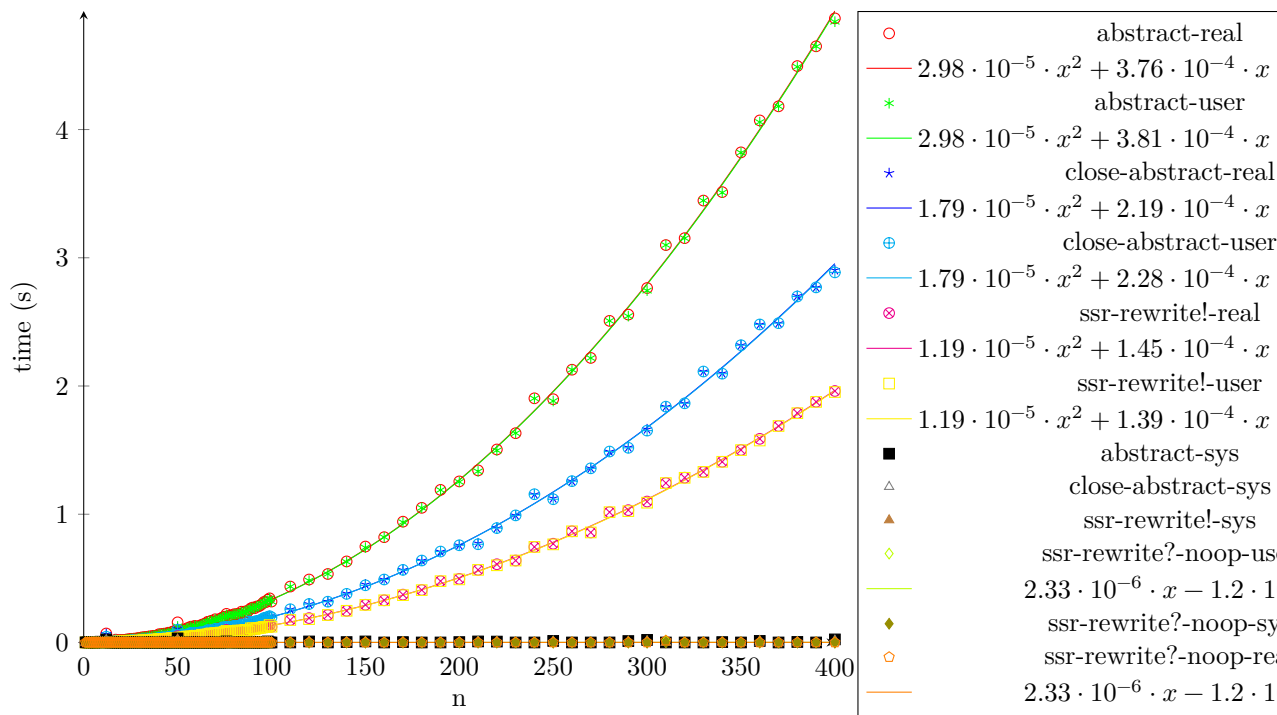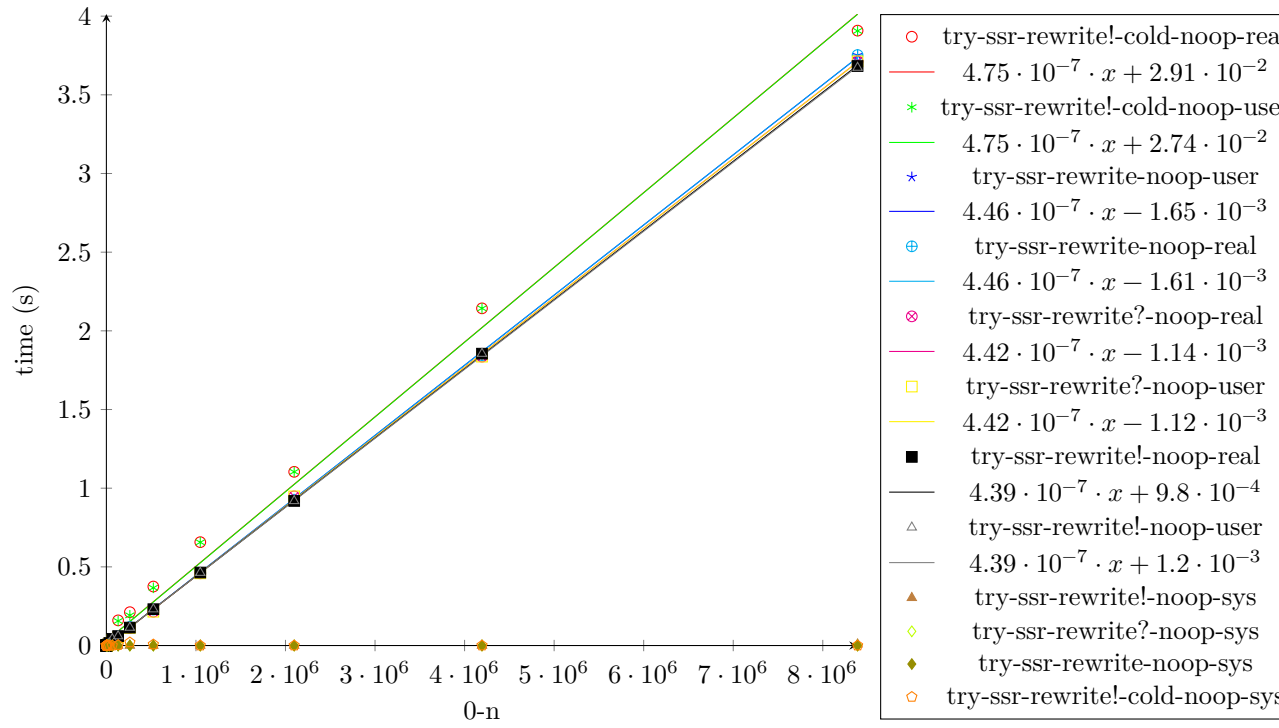Figure 8: timing-rewrite-repeated-app-ssrrewrite

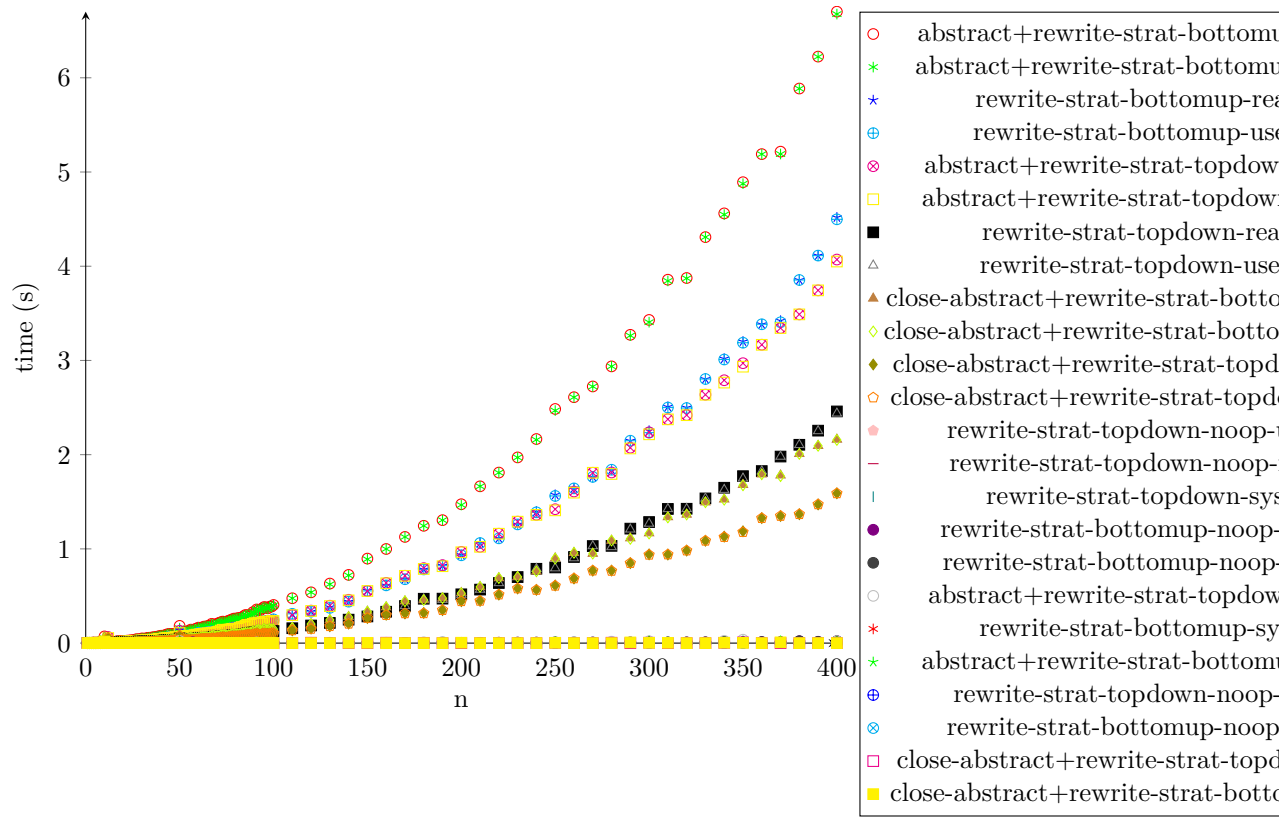Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

Figure 10: timing-rewrite-repeated-app-rewrite-strat
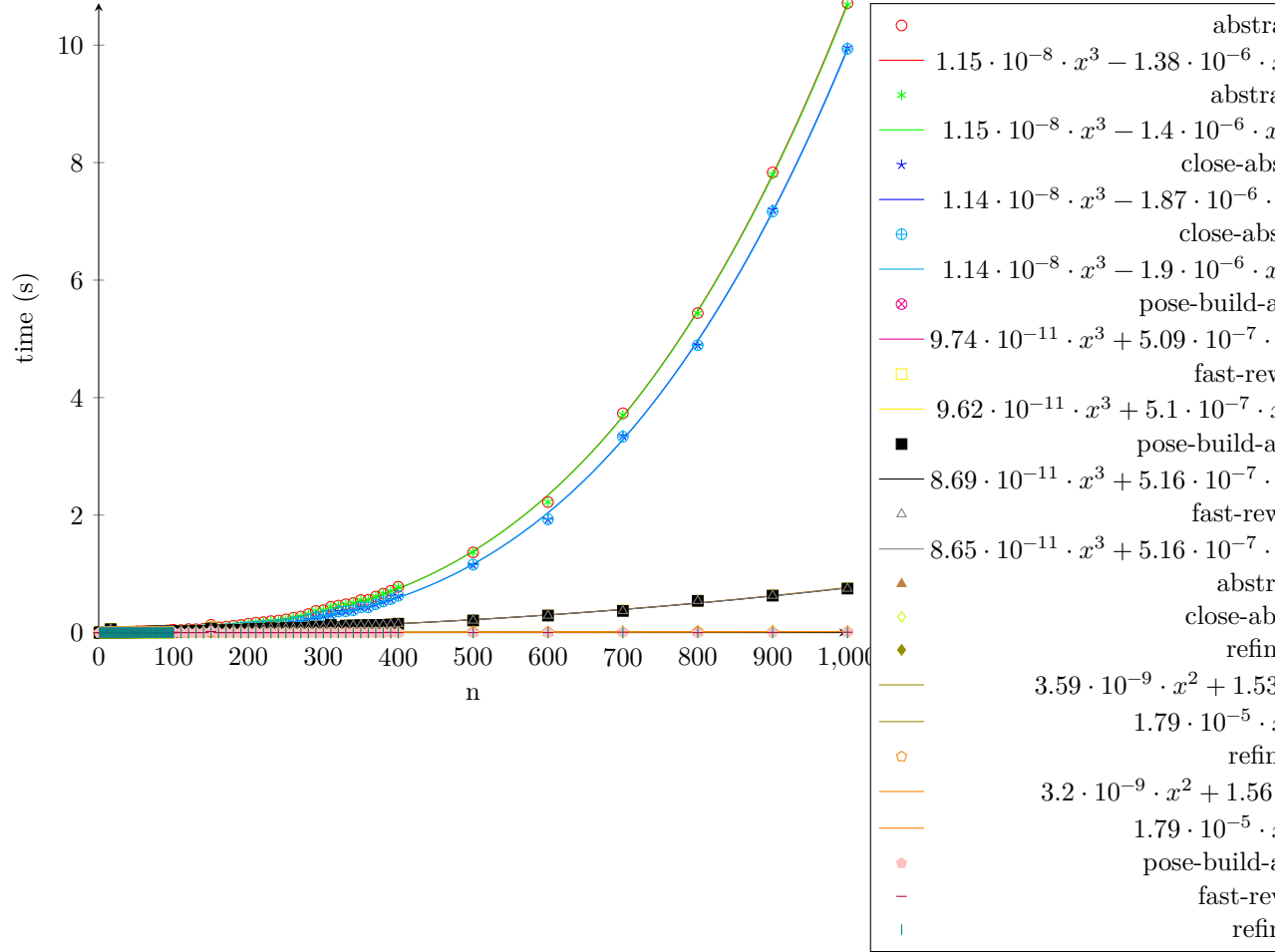
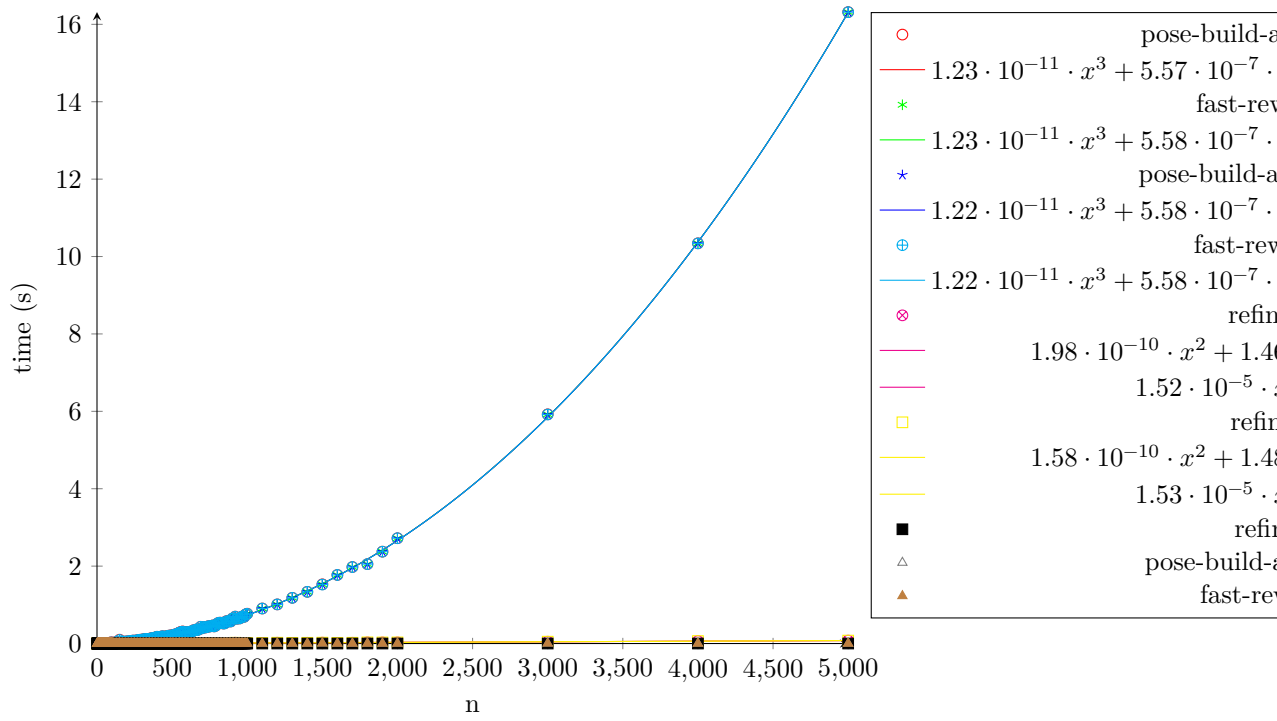Figure 11: timing-rewrite-repeated-app-fast-rewrite

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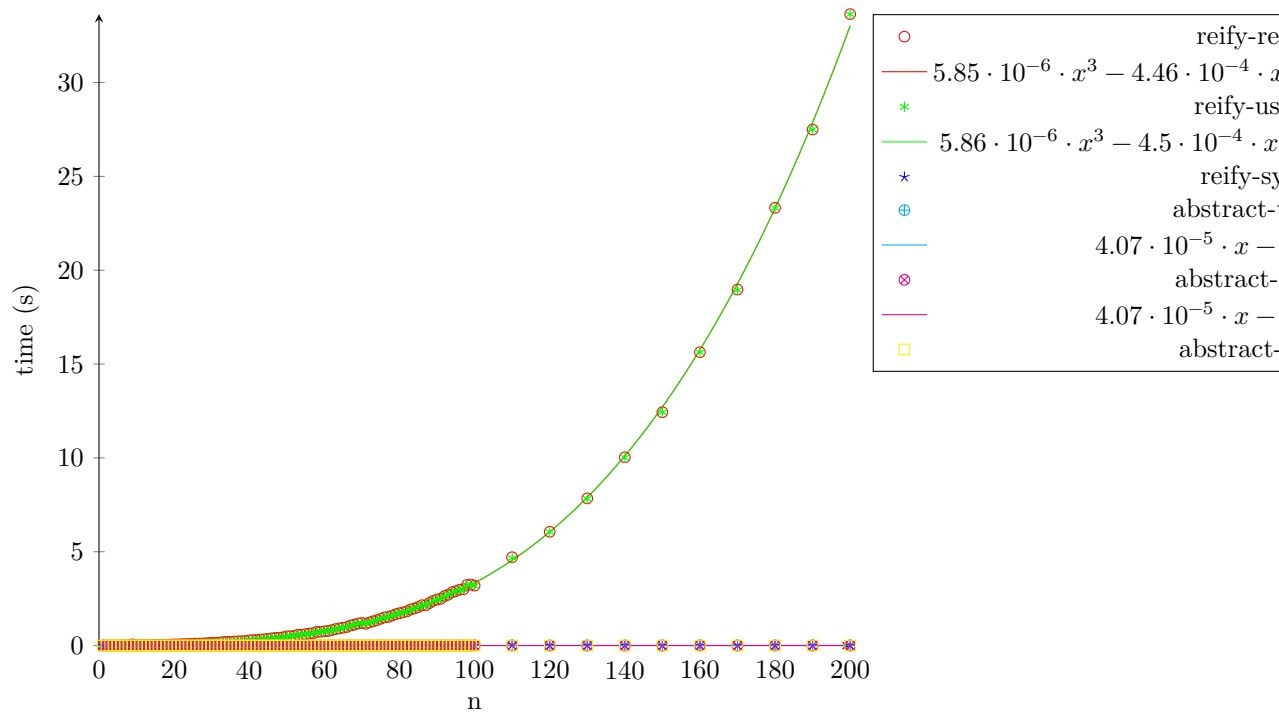Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
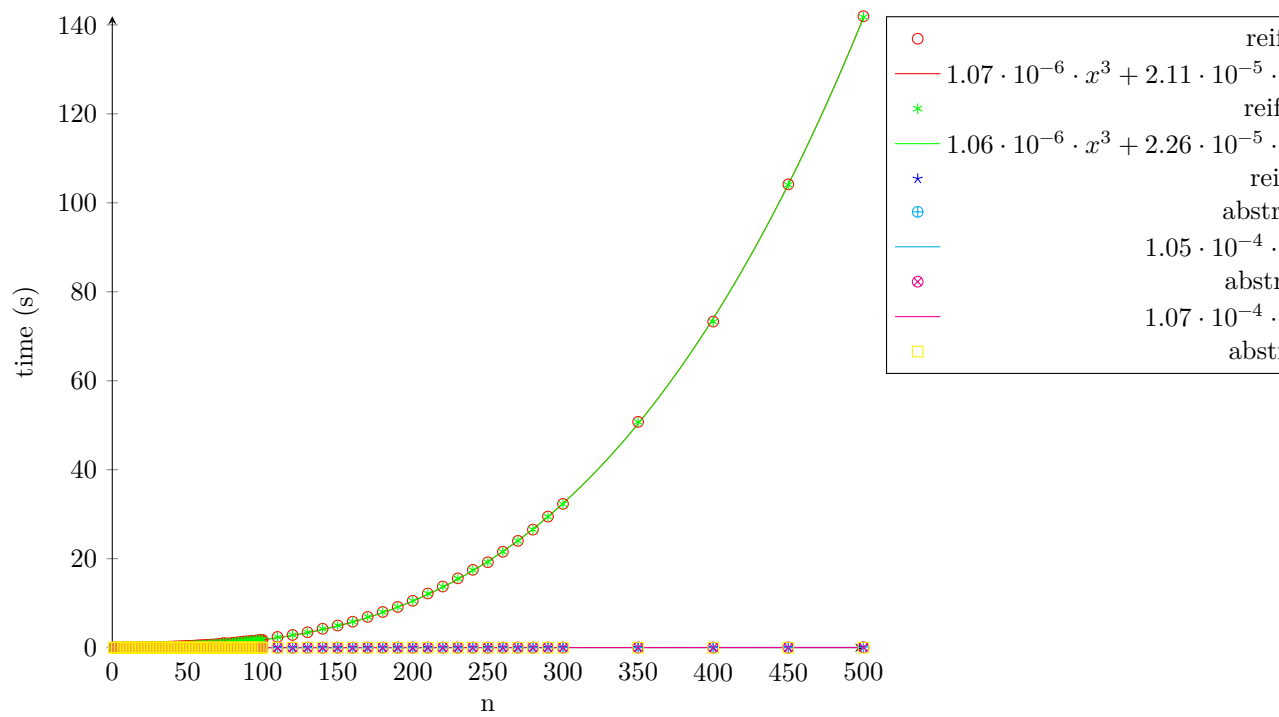
Figure 13: timing-typeclass-reification-let-in-HOAS

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

time (s)

20

15

10

5

0

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

n

abstract-real
$2.31 \cdot 10^{-6} \cdot x^2 + 8.62 \cdot 10^{-5} \cdot x$
abstract-user
$2.31 \cdot 10^{-6} \cdot x^2 + 8.06 \cdot 10^{-5} \cdot x$
fast-rewrite-real
$1.92 \cdot 10^{-6} \cdot x^2 + 5.04 \cdot 10^{-5} \cdot x$
fast-rewrite-user
$1.92 \cdot 10^{-6} \cdot x^2 + 4.62 \cdot 10^{-5} \cdot x$
close-abstract-real
$3.97 \cdot 10^{-7} \cdot x^2 + 3.44 \cdot 10^{-5} \cdot x$
close-abstract-user
$3.97 \cdot 10^{-7} \cdot x^2 + 3.29 \cdot 10^{-5} \cdot x$
check-pf-cast-real
$2.98 \cdot 10^{-7} \cdot x^2 - 5.47 \cdot 10^{-5} \cdot x$
check-pf-cast-user
$2.98 \cdot 10^{-7} \cdot x^2 - 5.48 \cdot 10^{-5} \cdot x$
type-admit-user
$2.85 \cdot 10^{-7} \cdot x^2 - 4.69 \cdot 10^{-5} \cdot x$
type-admit-real
$2.86 \cdot 10^{-7} \cdot x^2 - 4.69 \cdot 10^{-5} \cdot x$
type-admit-cast-user
$2.84 \cdot 10^{-7} \cdot x^2 - 1.66 \cdot 10^{-5} \cdot x$
type-admit-cast-real
$2.84 \cdot 10^{-7} \cdot x^2 - 1.58 \cdot 10^{-5} \cdot x$
type-pf-cast-real
$2.79 \cdot 10^{-7} \cdot x^2 - 2.14 \cdot 10^{-5} \cdot x$
type-pf-cast-user
$2.78 \cdot 10^{-7} \cdot x^2 - 2.1 \cdot 10^{-5} \cdot x$
refine-user
$2.74 \cdot 10^{-7} \cdot x^2 - 2.03 \cdot 10^{-5} \cdot x$
$5.48 \cdot 10^{-4} \cdot x - 5.98 \cdot$
refine-real
$2.74 \cdot 10^{-7} \cdot x^2 - 2 \cdot 10^{-5} \cdot x$
$5.48 \cdot 10^{-4} \cdot x - 5.97 \cdot$
check-admit-cast-user
$2.62 \cdot 10^{-7} \cdot x^2 - 1.16 \cdot 10^{-5} \cdot x$
check-admit-cast-real
$2.62 \cdot 10^{-7} \cdot x^2 - 1.15 \cdot 10^{-5} \cdot x$
check-admit-user
$2.31 \cdot 10^{-7} \cdot x^2 + 3.58 \cdot 10^{-5} \cdot x$
check-admit-real
$2.3 \cdot 10^{-7} \cdot x^2 + 3.6 \cdot 10^{-5} \cdot x$
build-eval-thunk-user
$1.2 \cdot 10^{-4} \cdot x - 1.35 \cdot$
build-eval-thunk-real
$1.21 \cdot 10^{-4} \cdot x - 1.14 \cdot$
build-thunk-user
$1.19 \cdot 10^{-4} \cdot x - 1.42 \cdot$
build-thunk-real
$1.2 \cdot 10^{-4} \cdot x - 1.22 \cdot$
type-L-user

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