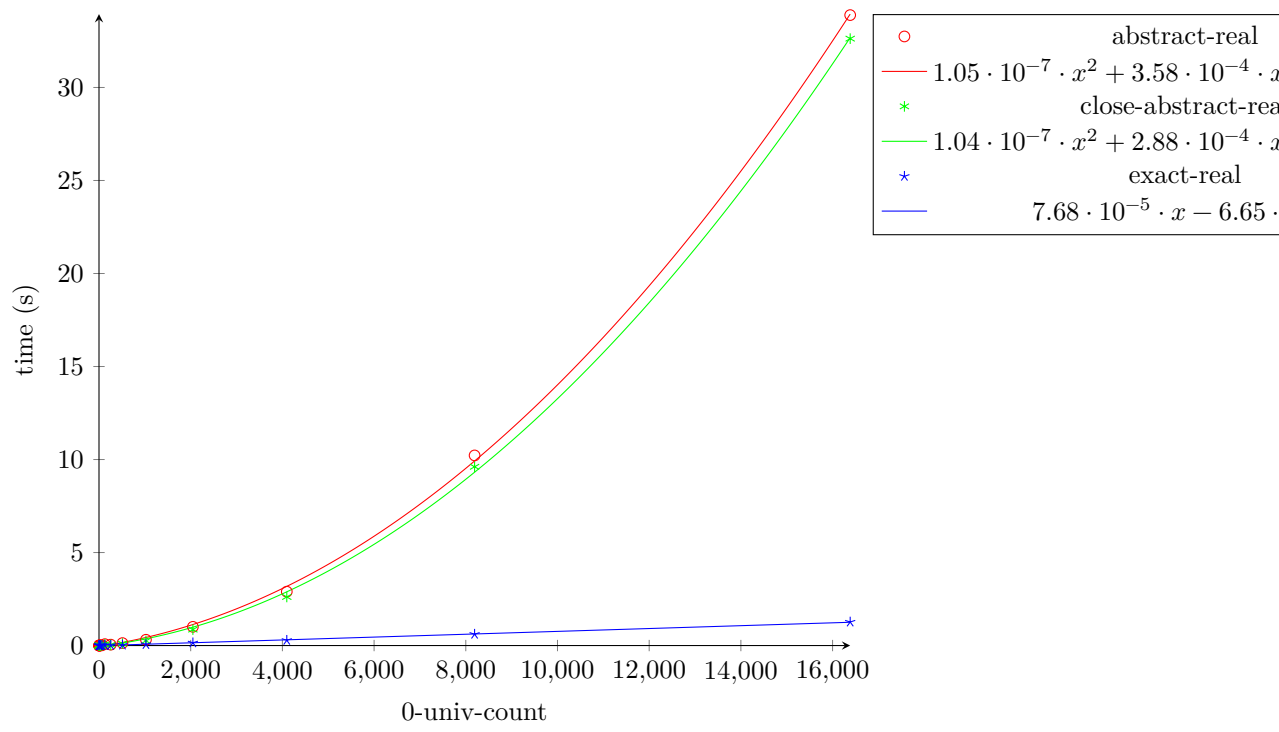Figure 1: timing-pattern

1

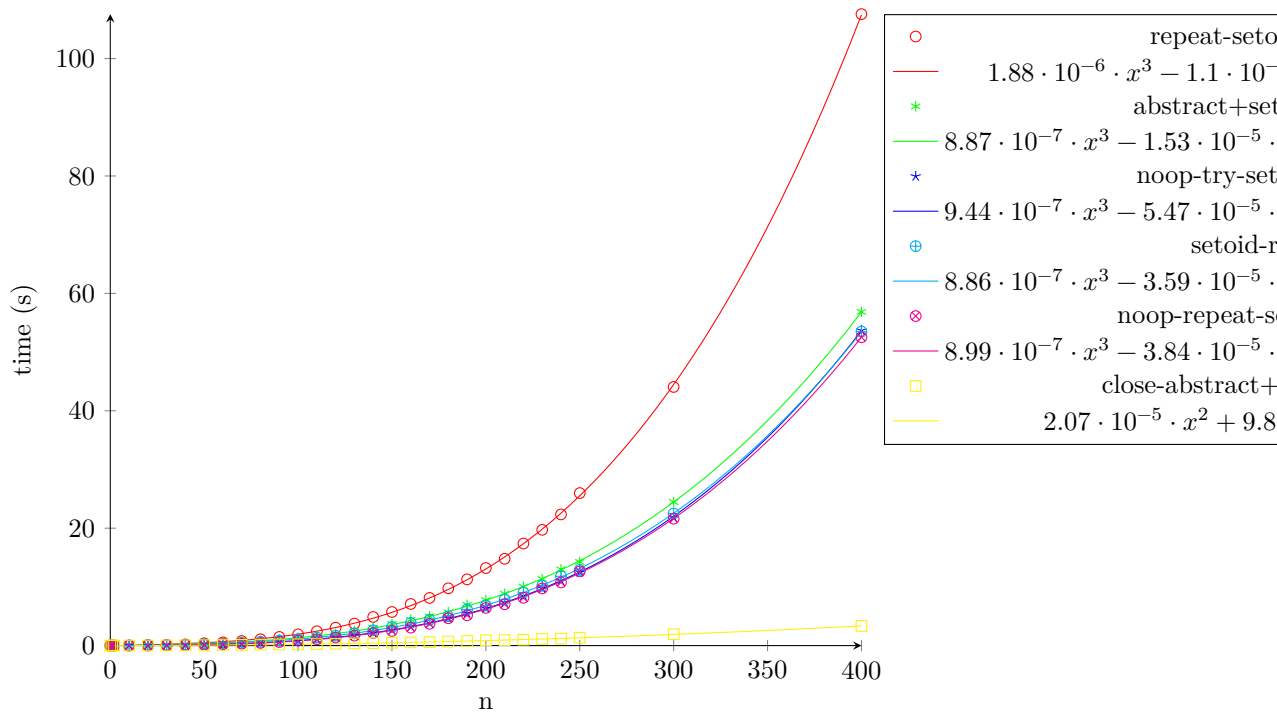Figure 2: timing-n-polymorphic-universes param-1-n 0

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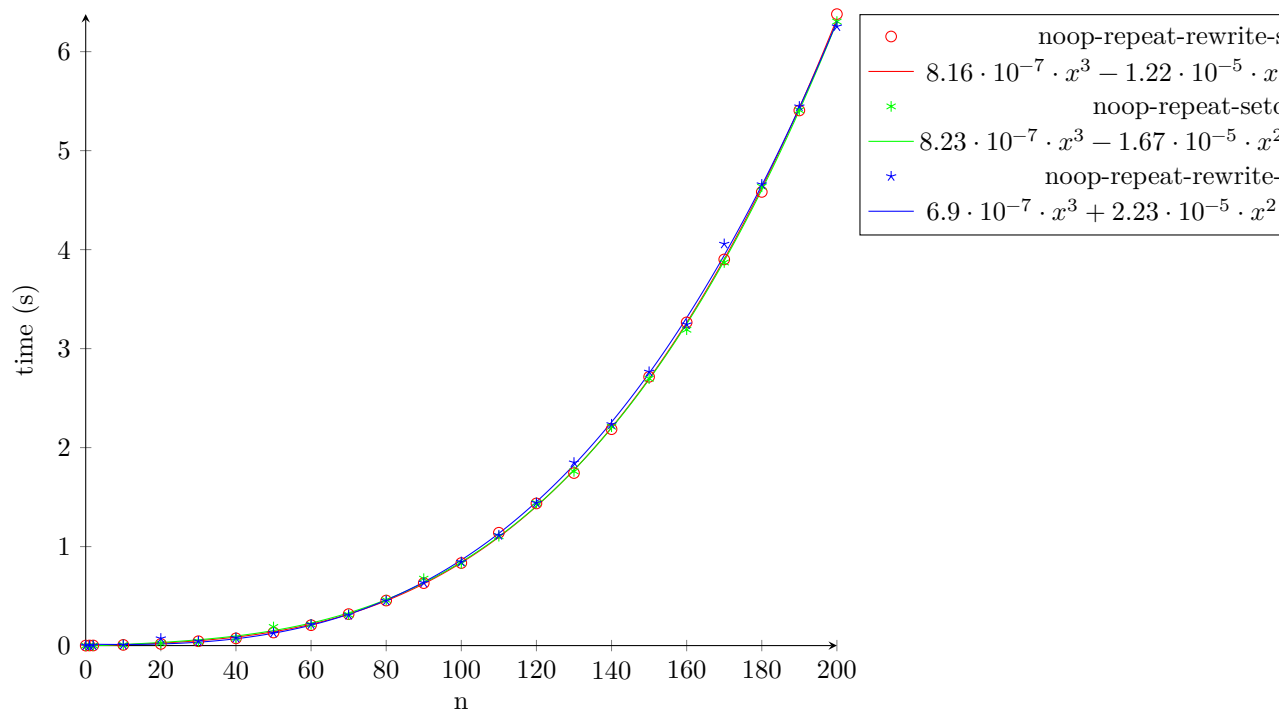
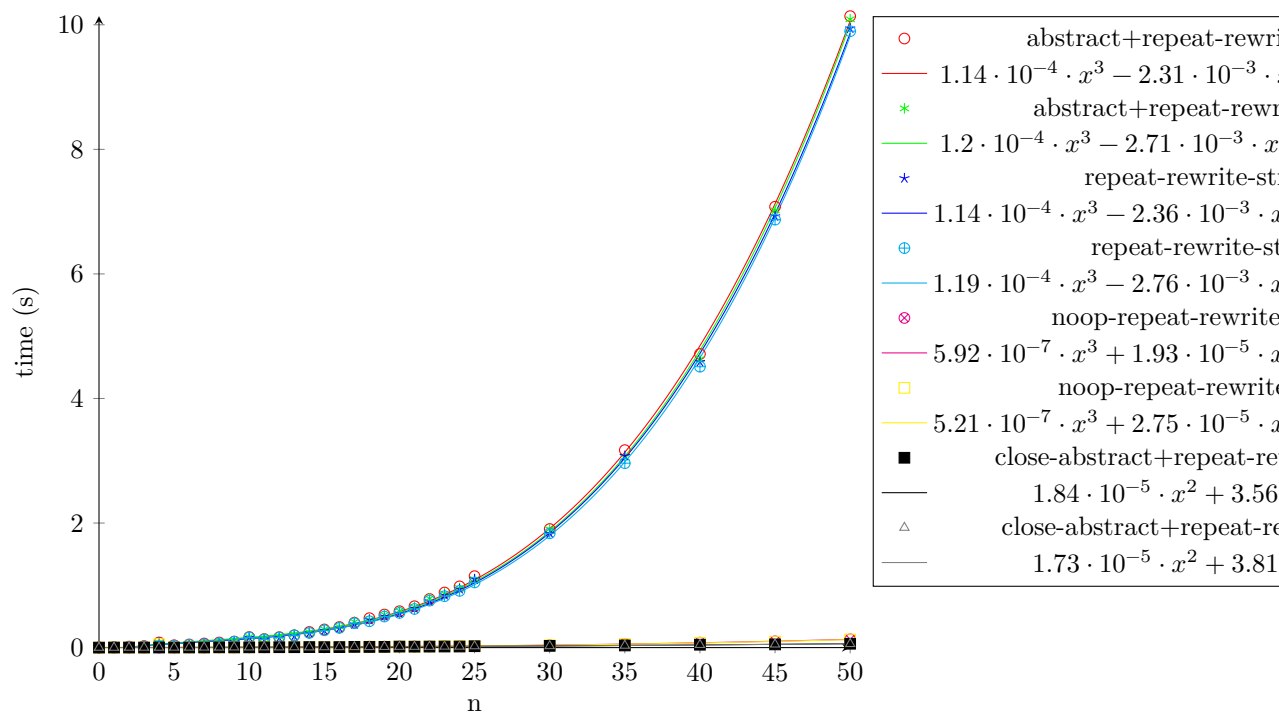Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

4

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

The chart shows a plot with x-axis labeled "n" ranging from 0 to 50, and y-axis labeled "time (s)" ranging from 0 to 10.

Legend entries:
- ○ abstract+repeat-rewri...
- $1.14 \cdot 10^{-4} \cdot x^3 - 2.31 \cdot 10^{-3} \cdot ...$
- * abstract+repeat-rewr...
- $1.2 \cdot 10^{-4} \cdot x^3 - 2.71 \cdot 10^{-3} \cdot x ...$
- ★ repeat-rewrite-st...
- $1.14 \cdot 10^{-4} \cdot x^3 - 2.36 \cdot 10^{-3} \cdot x ...$
- ⊕ repeat-rewrite-st...
- $1.19 \cdot 10^{-4} \cdot x^3 - 2.76 \cdot 10^{-3} \cdot x ...$
- ⊗ noop-repeat-rewrite...
- $5.92 \cdot 10^{-7} \cdot x^3 + 1.93 \cdot 10^{-5} \cdot x ...$
- □ noop-repeat-rewrite...
- $5.21 \cdot 10^{-7} \cdot x^3 + 2.75 \cdot 10^{-5} \cdot x ...$
- ■ close-abstract+repeat-re...
- $1.84 \cdot 10^{-5} \cdot x^2 + 3.56 ...$
- △ close-abstract+repeat-re...
- $1.73 \cdot 10^{-5} \cdot x^2 + 3.81 ...$

5

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

abstract+autorewrit
$2.83 \cdot 10^{-5} \cdot x^2 - 6.19 \cdot 10^{-4} \cdot$
abstract+rewrite!-
$2.86 \cdot 10^{-5} \cdot x^2 - 7.2 \cdot 10^{-4} \cdot x$
rewrite!-real
$1.91 \cdot 10^{-5} \cdot x^2 - 9.56 \cdot 10^{-4} \cdot$
autorewrite-rea
$1.87 \cdot 10^{-5} \cdot x^2 - 8.5 \cdot 10^{-4} \cdot x$
close-abstract+autorew
$9.54 \cdot 10^{-6} \cdot x^2 + 2.09 \cdot 10^{-4} \cdot$
close-abstract+rewrit
$9.48 \cdot 10^{-6} \cdot x^2 + 2.19 \cdot 10^{-4} \cdot$
rewrite?-noop-re
$2.4 \cdot 10^{-5} \cdot x - 9.56 \cdot$
autorewrite-noop-
$2.24 \cdot 10^{-5} \cdot x - 8.33$

6
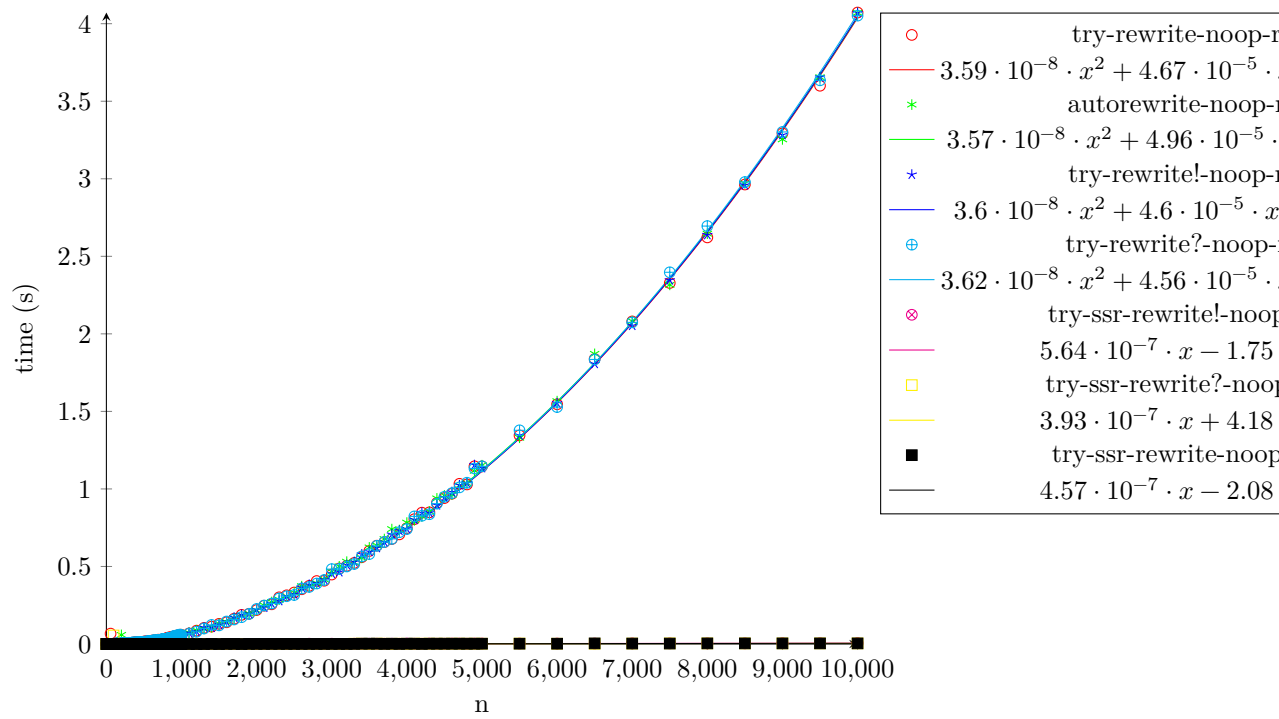
Figure 7: timing-rewrite-repeated-app-autorewrite-noop
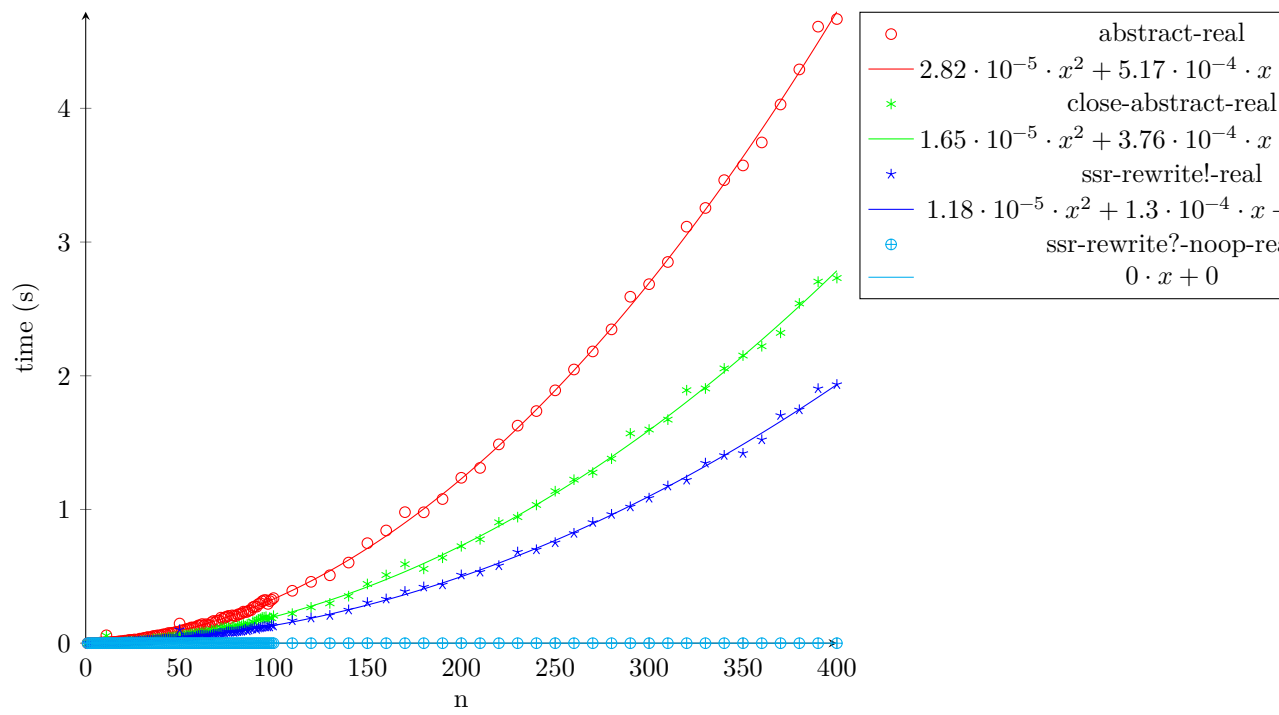
Figure 8: timing-rewrite-repeated-app-ssrrewrite

The chart legend contains the following entries:

abstract-real
$2.82 \cdot 10^{-5} \cdot x^2 + 5.17 \cdot 10^{-4} \cdot x$

close-abstract-real
$1.65 \cdot 10^{-5} \cdot x^2 + 3.76 \cdot 10^{-4} \cdot x$

ssr-rewrite!-real
$1.18 \cdot 10^{-5} \cdot x^2 + 1.3 \cdot 10^{-4} \cdot x$

ssr-rewrite?-noop-real
$0 \cdot x + 0$

The axes are labeled "time (s)" (vertical) and "n" (horizontal).
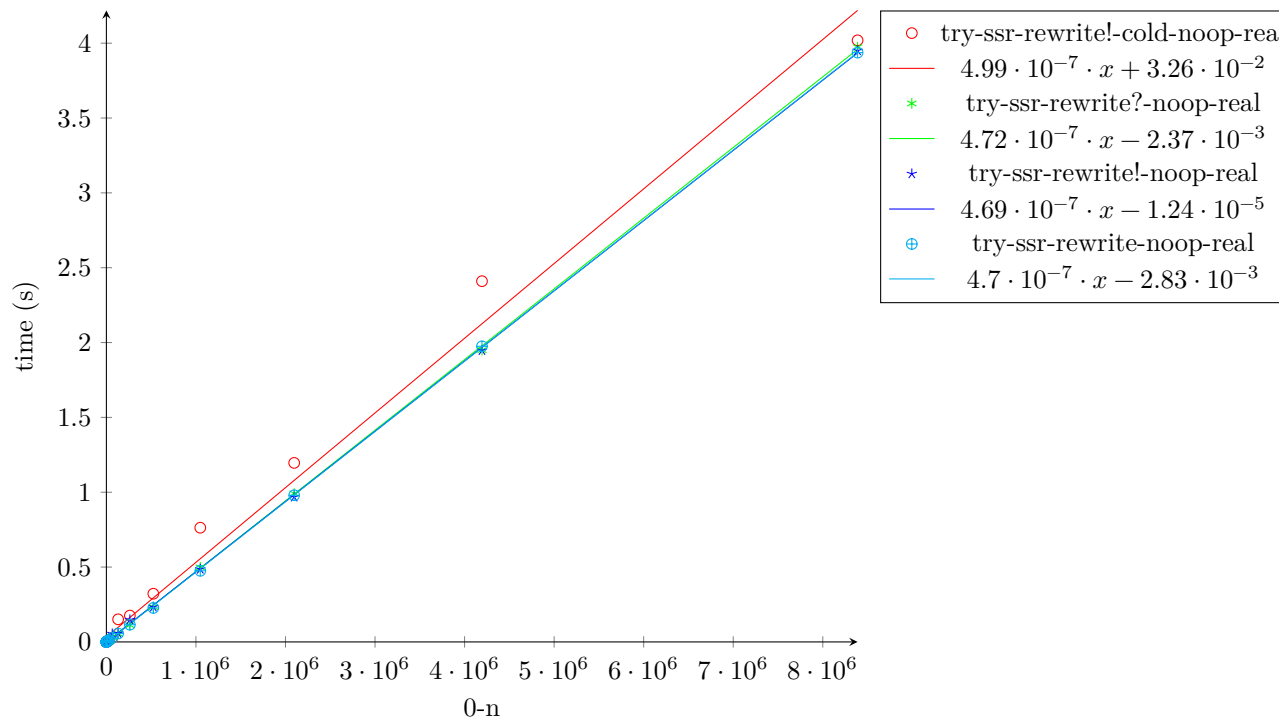
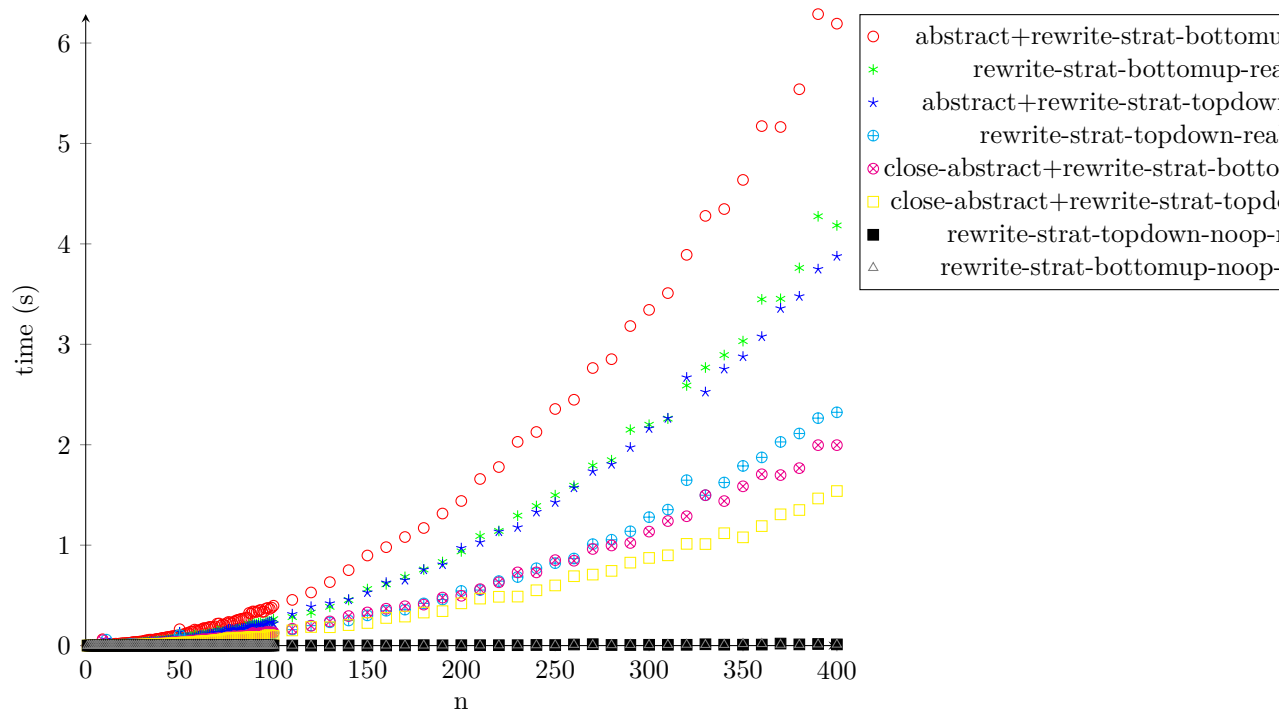Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

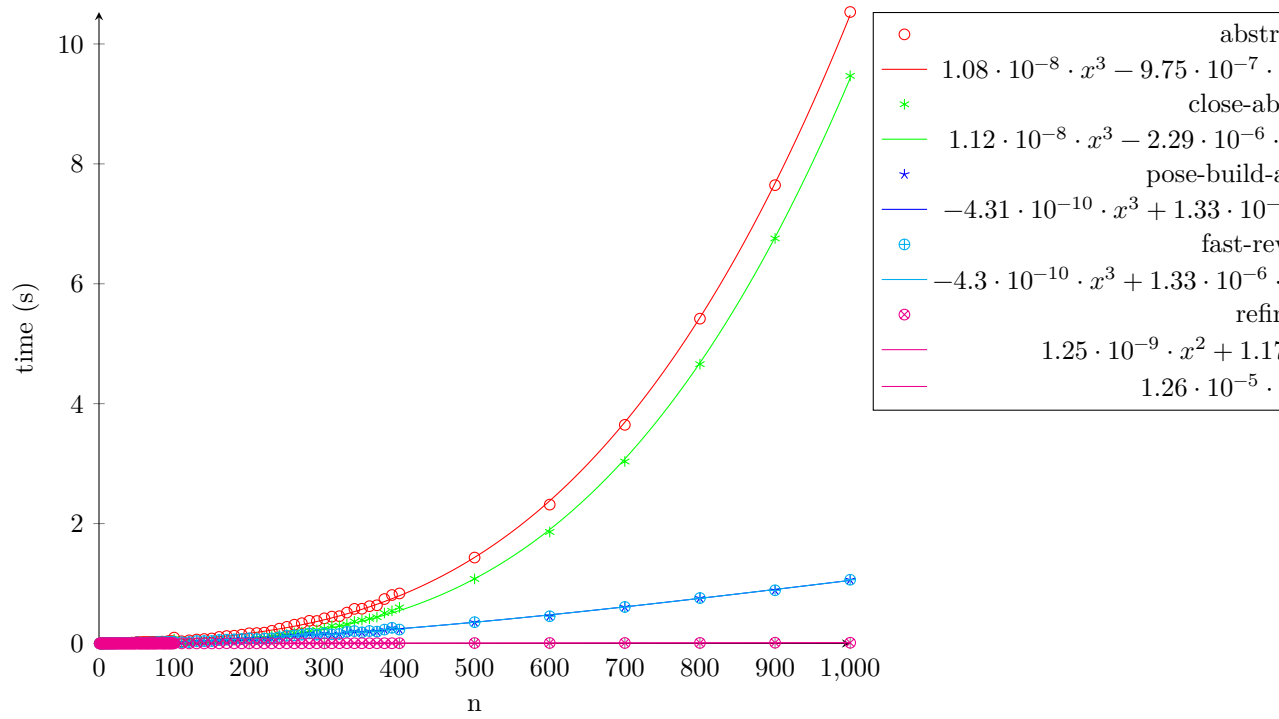Figure 10: timing-rewrite-repeated-app-rewrite-strat

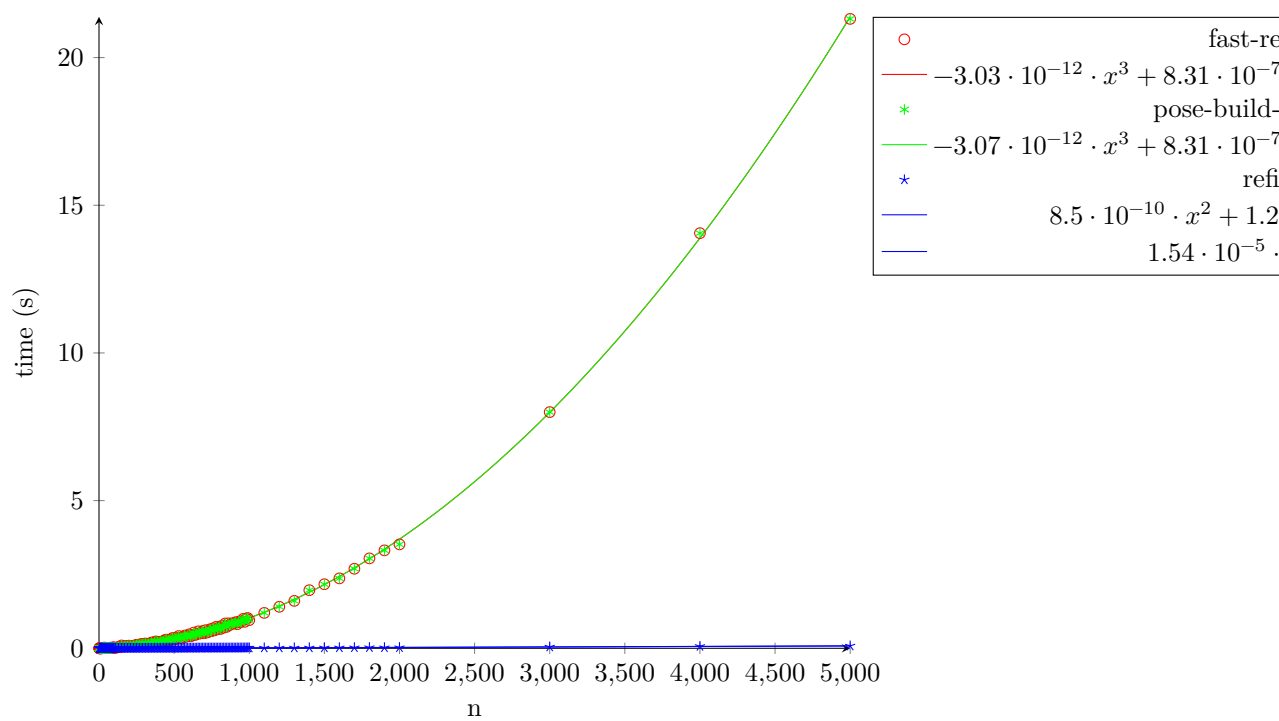Figure 11: timing-rewrite-repeated-app-fast-rewrite

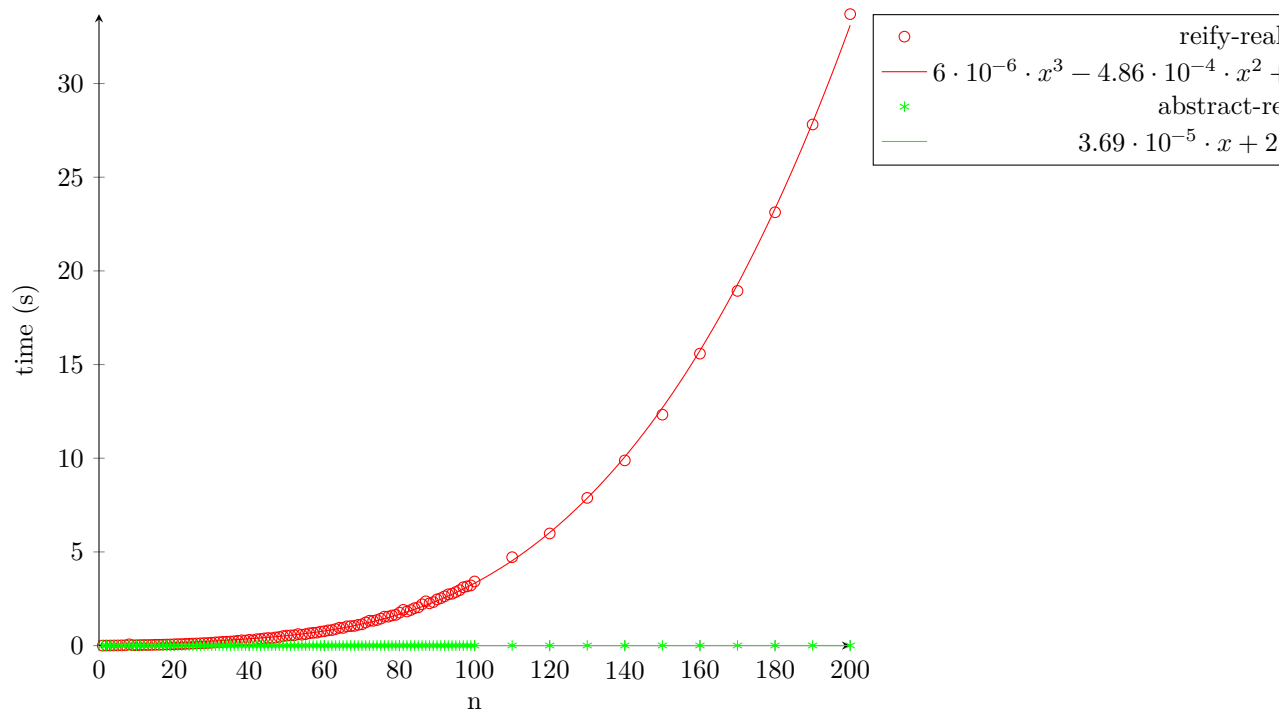Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract

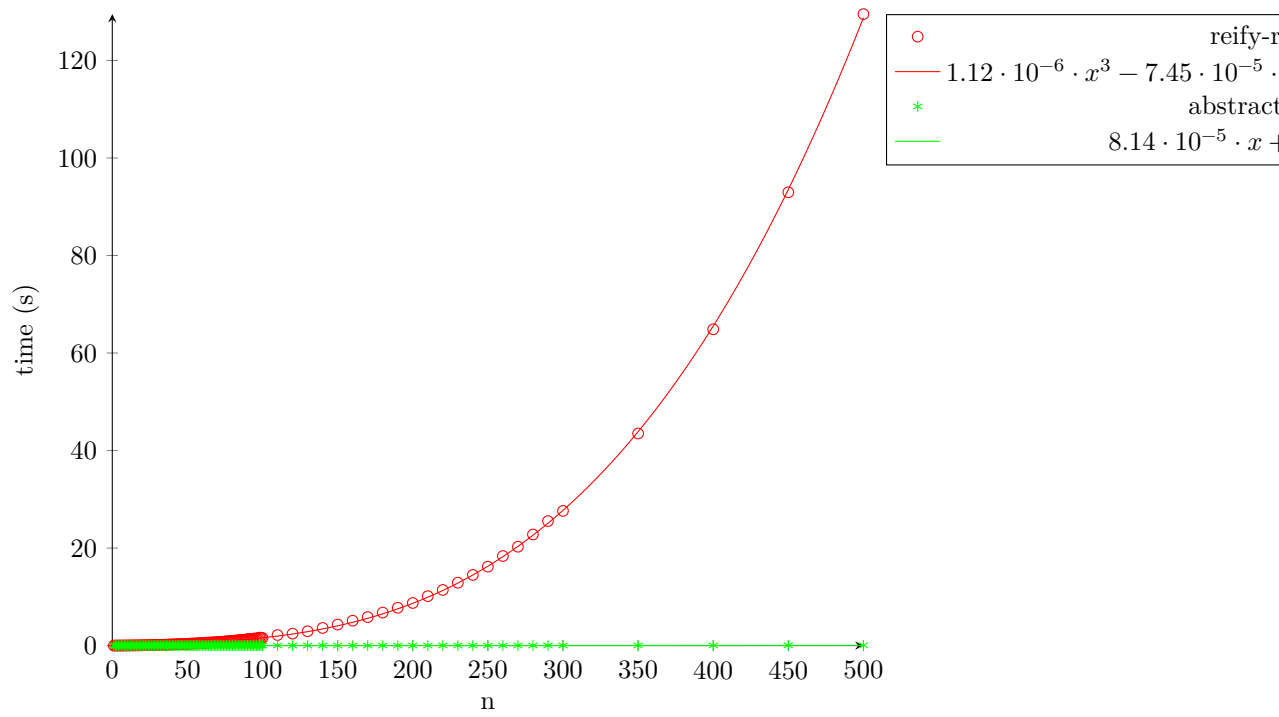Figure 13: timing-typeclass-reification-let-in-HOAS

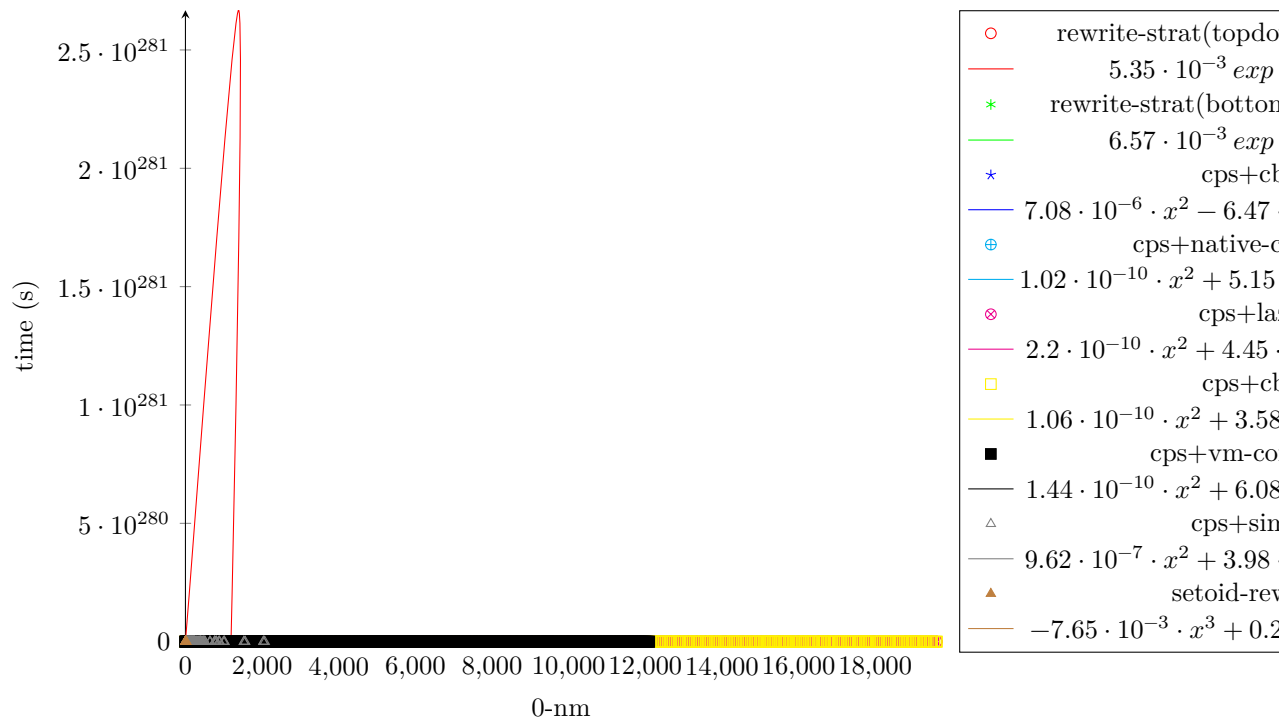Figure 14: timing-typeclass-reification-let-in-PHOAS

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

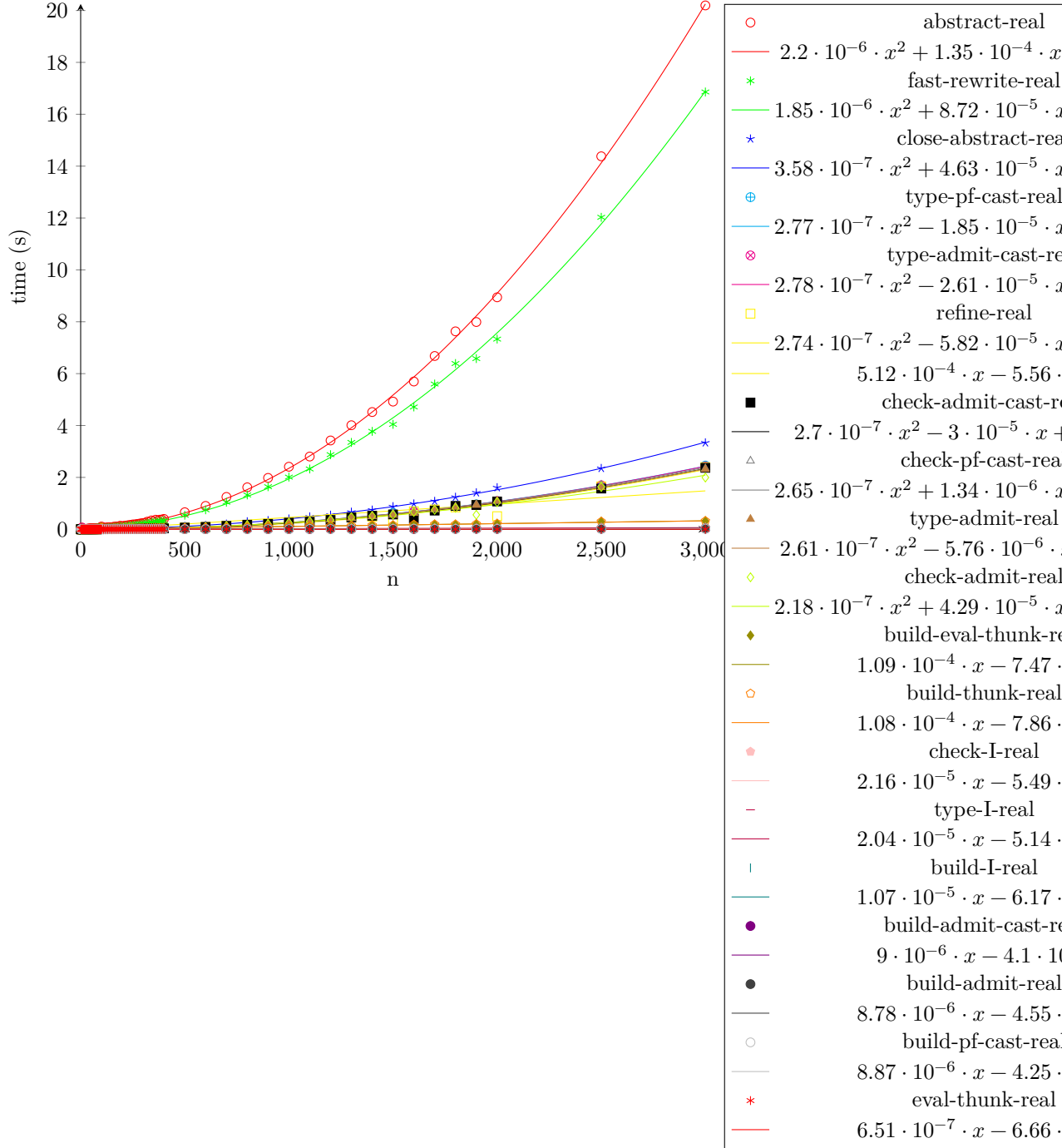|	abstract-real
	$2.2 \cdot 10^{-6} \cdot x^2 + 1.35 \cdot 10^{-4} \cdot x$
	fast-rewrite-real
	$1.85 \cdot 10^{-6} \cdot x^2 + 8.72 \cdot 10^{-5} \cdot x$
	close-abstract-real
	$3.58 \cdot 10^{-7} \cdot x^2 + 4.63 \cdot 10^{-5} \cdot x$
	type-pf-cast-real
	$2.77 \cdot 10^{-7} \cdot x^2 - 1.85 \cdot 10^{-5} \cdot x$
	type-admit-cast-real
	$2.78 \cdot 10^{-7} \cdot x^2 - 2.61 \cdot 10^{-5} \cdot x$
	refine-real
	$2.74 \cdot 10^{-7} \cdot x^2 - 5.82 \cdot 10^{-5} \cdot x$
	$5.12 \cdot 10^{-4} \cdot x - 5.56 \cdot$
	check-admit-cast-real
	$2.7 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-5} \cdot x +$
	check-pf-cast-real
	$2.65 \cdot 10^{-7} \cdot x^2 + 1.34 \cdot 10^{-6} \cdot x$
	type-admit-real
	$2.61 \cdot 10^{-7} \cdot x^2 - 5.76 \cdot 10^{-6} \cdot x$
	check-admit-real
	$2.18 \cdot 10^{-7} \cdot x^2 + 4.29 \cdot 10^{-5} \cdot x$
	build-eval-thunk-real
	$1.09 \cdot 10^{-4} \cdot x - 7.47 \cdot$
	build-thunk-real
	$1.08 \cdot 10^{-4} \cdot x - 7.86 \cdot$
	check-I-real
	$2.16 \cdot 10^{-5} \cdot x - 5.49 \cdot$
	type-I-real
	$2.04 \cdot 10^{-5} \cdot x - 5.14 \cdot$
	build-I-real
	$1.07 \cdot 10^{-5} \cdot x - 6.17 \cdot$
	build-admit-cast-real
	$9 \cdot 10^{-6} \cdot x - 4.1 \cdot 10$
	build-admit-real
	$8.78 \cdot 10^{-6} \cdot x - 4.55 \cdot$
	build-pf-cast-real
	$8.87 \cdot 10^{-6} \cdot x - 4.25 \cdot$
	eval-thunk-real
	$6.51 \cdot 10^{-7} \cdot x - 6.66 \cdot$

Figure 16: timing-rewrite-repeated-app-fast-rewrite-ltac2

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