Figure 1: timing-pattern

1

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

The legend accompanying the figure reads:

- abstract-real
- $9.52 \cdot 10^{-10} \cdot x^2 + 1.79 \cdot 10^{-4} \cdot$
- abstract-user
- $8.61 \cdot 10^{-10} \cdot x^2 + 1.78 \cdot 10^{-4} \cdot$
- close-abstract-re
- $1.04 \cdot 10^{-9} \cdot x^2 + 1.25 \cdot 10^{-4} \cdot$
- close-abstract-us
- $1.07 \cdot 10^{-9} \cdot x^2 + 1.23 \cdot 10^{-4} \cdot$
- exact-real
- $5.24 \cdot 10^{-5} \cdot x - 2.47$
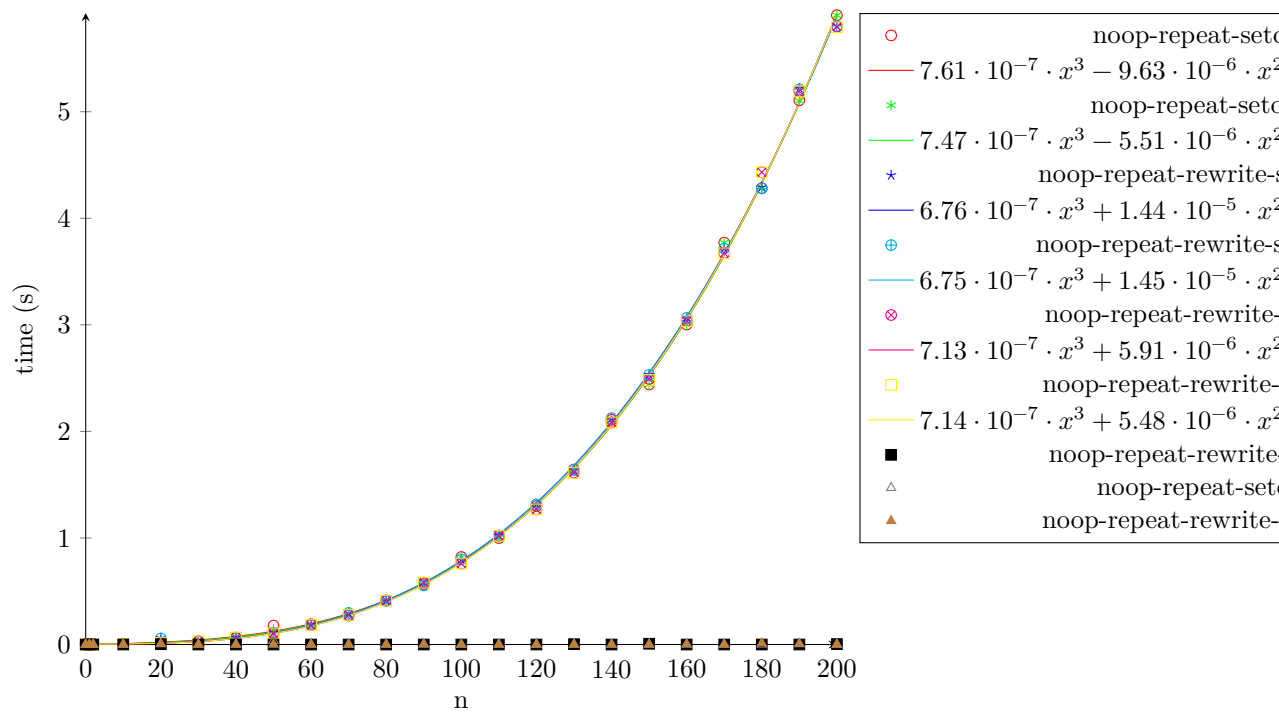- exact-user
- $5.14 \cdot 10^{-5} \cdot x - 2.58$
- abstract-sys
- close-abstract-sy
- exact-sys

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

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

The legend shown in the figure reads:

- ○ noop-repeat-seto
- — $7.61 \cdot 10^{-7} \cdot x^3 - 9.63 \cdot 10^{-6} \cdot x^2$
- ∗ noop-repeat-seto
- — $7.47 \cdot 10^{-7} \cdot x^3 - 5.51 \cdot 10^{-6} \cdot x^2$
- ⋆ noop-repeat-rewrite-s
- — $6.76 \cdot 10^{-7} \cdot x^3 + 1.44 \cdot 10^{-5} \cdot x^2$
- ⊕ noop-repeat-rewrite-s
- — $6.75 \cdot 10^{-7} \cdot x^3 + 1.45 \cdot 10^{-5} \cdot x^2$
- ⊗ noop-repeat-rewrite-
- — $7.13 \cdot 10^{-7} \cdot x^3 + 5.91 \cdot 10^{-6} \cdot x^2$
- □ noop-repeat-rewrite-
- — $7.14 \cdot 10^{-7} \cdot x^3 + 5.48 \cdot 10^{-6} \cdot x^2$
- ■ noop-repeat-rewrite-
- △ noop-repeat-seto
- ▲ noop-repeat-rewrite-
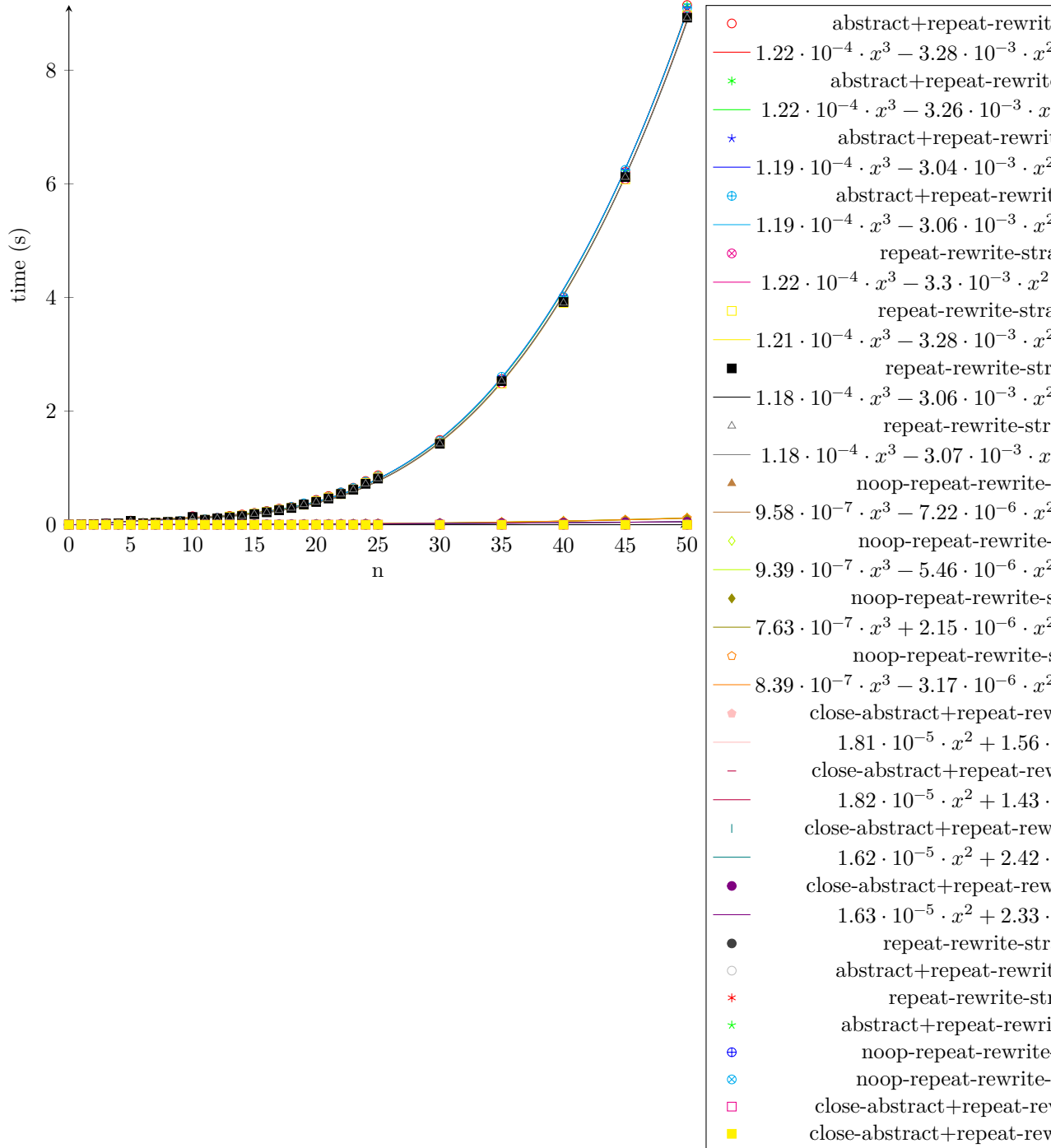
Figure 5: timing-rewrite-strat-under-binders

The plot shows time (s) on the y-axis (0 to 3) versus n on the x-axis (0 to 400).

Legend entries:

- abstract+rewrite!- (red circle)
- $2.29 \cdot 10^{-5} \cdot x^2 - 4.7 \cdot 10^{-4} \cdot x$
- abstract+rewrite!-u (green asterisk)
- $2.29 \cdot 10^{-5} \cdot x^2 - 4.77 \cdot 10^{-4} \cdot x$
- abstract+autorewrite (blue star)
- $2.23 \cdot 10^{-5} \cdot x^2 - 3.6 \cdot 10^{-4} \cdot x$
- abstract+autorewrite (cyan circled plus)
- $2.23 \cdot 10^{-5} \cdot x^2 - 3.43 \cdot 10^{-4} \cdot x$
- rewrite!-real (magenta circled cross)
- $1.47 \cdot 10^{-5} \cdot x^2 - 4.56 \cdot 10^{-4} \cdot x$
- rewrite!-user (yellow open square)
- $1.47 \cdot 10^{-5} \cdot x^2 - 4.54 \cdot 10^{-4} \cdot x$
- autorewrite-user (black filled square)
- $1.45 \cdot 10^{-5} \cdot x^2 - 4.32 \cdot 10^{-4} \cdot x$
- autorewrite-rea (grey open triangle)
- $1.45 \cdot 10^{-5} \cdot x^2 - 4.22 \cdot 10^{-4} \cdot x$
- close-abstract+rewrit (brown filled triangle)
- $8.17 \cdot 10^{-6} \cdot x^2 - 3.4 \cdot 10^{-5} \cdot x$
- close-abstract+rewrit (yellow-green diamond)
- $8.17 \cdot 10^{-6} \cdot x^2 - 3.95 \cdot 10^{-5} \cdot x$
- close-abstract+autorew (olive filled diamond)
- $7.86 \cdot 10^{-6} \cdot x^2 + 4.62 \cdot 10^{-5} \cdot x$
- close-abstract+autorew (orange pentagon)
- $7.85 \cdot 10^{-6} \cdot x^2 + 5.41 \cdot 10^{-5} \cdot x$
- rewrite!-sys (pink pentagon)
- abstract+rewrite!- (pink dash)
- autorewrite-noop-u (blue bar)
- $2.05 \cdot 10^{-5} \cdot x - 8.02$
- autorewrite-noop-r (purple filled circle)
- $2.05 \cdot 10^{-5} \cdot x - 8.02$
- rewrite?-noop-us (black filled circle)
- $2 \cdot 10^{-5} \cdot x - 7.54$
- rewrite?-noop-re (grey open circle)
- $1.95 \cdot 10^{-5} \cdot x - 7.02$
- rewrite?-noop-sy (red asterisk)
- close-abstract+rewrit (green star)
- close-abstract+autorew (blue circled plus)
- autorewrite-sys (cyan circled cross)
- autorewrite-noop- (magenta open square)
- abstract+autorewrit (yellow filled square)

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

6

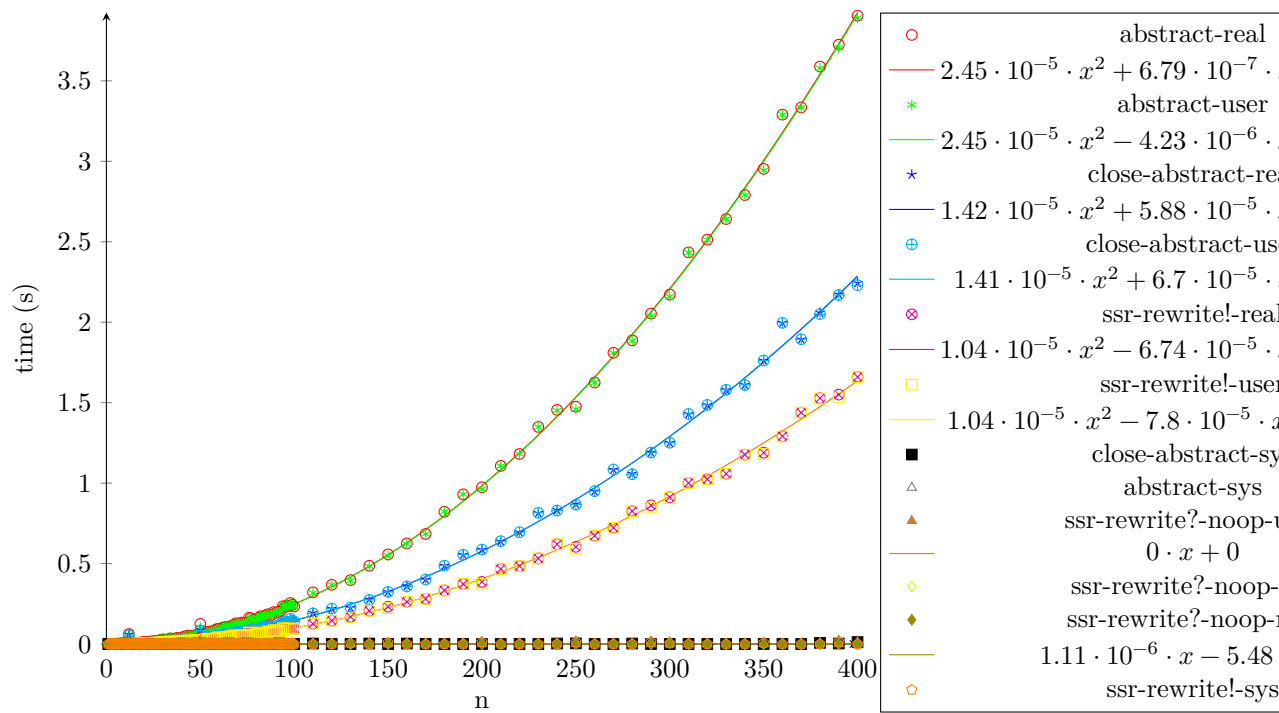Figure 7: timing-rewrite-repeated-app-autorewrite-noop

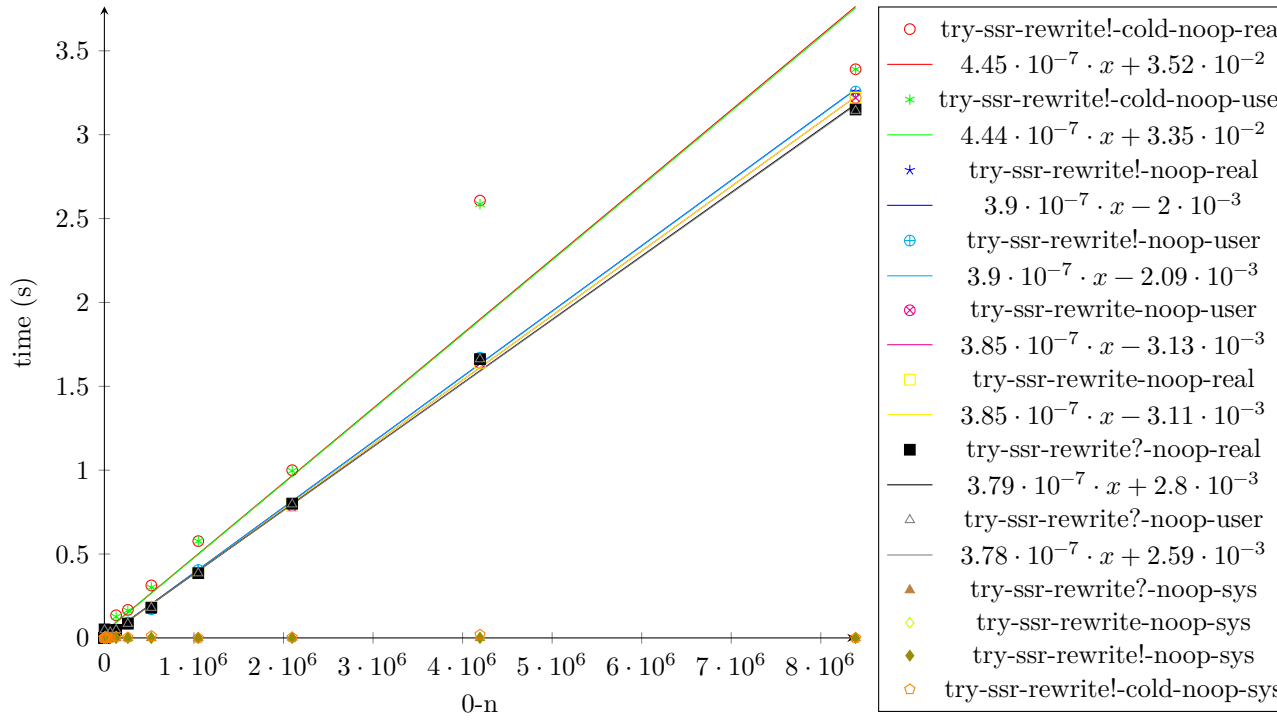Figure 8: timing-rewrite-repeated-app-ssrrewrite

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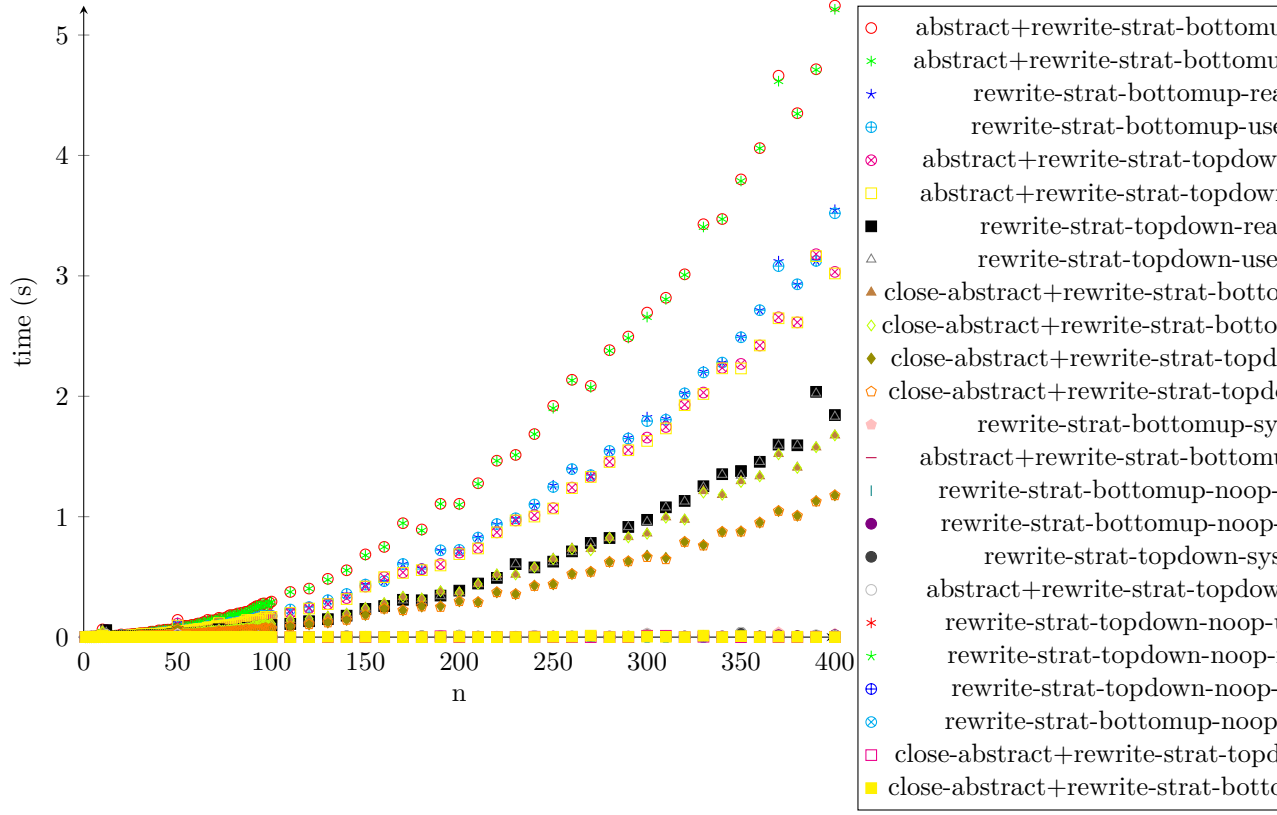
9

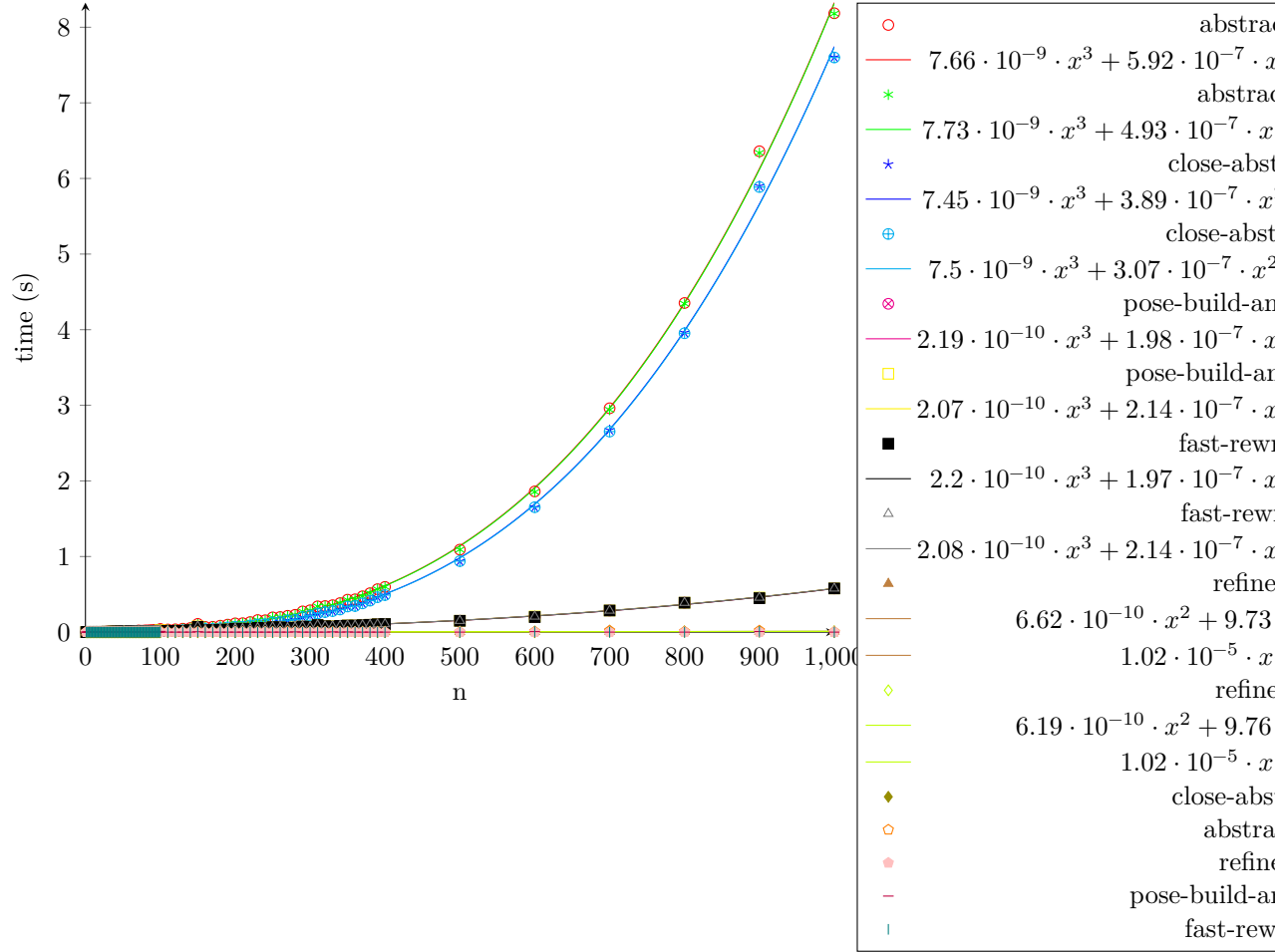Figure 10: timing-rewrite-repeated-app-rewrite-strat

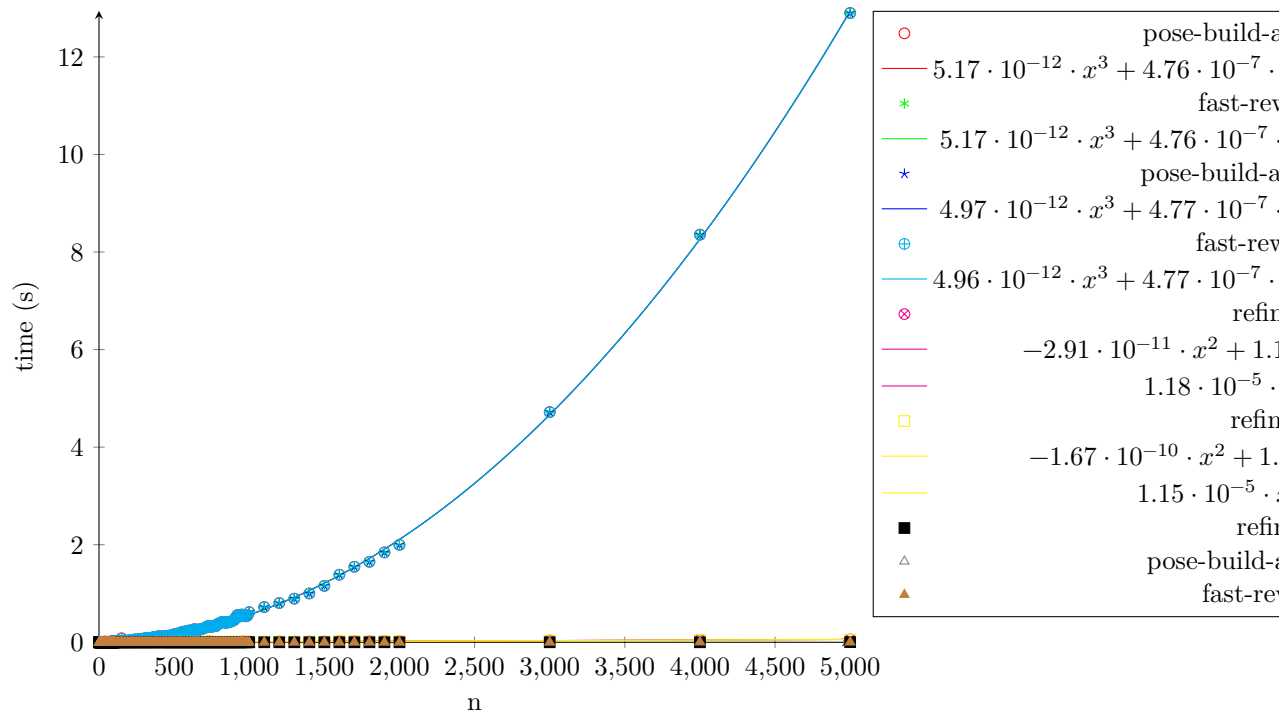Figure 11: timing-rewrite-repeated-app-fast-rewrite

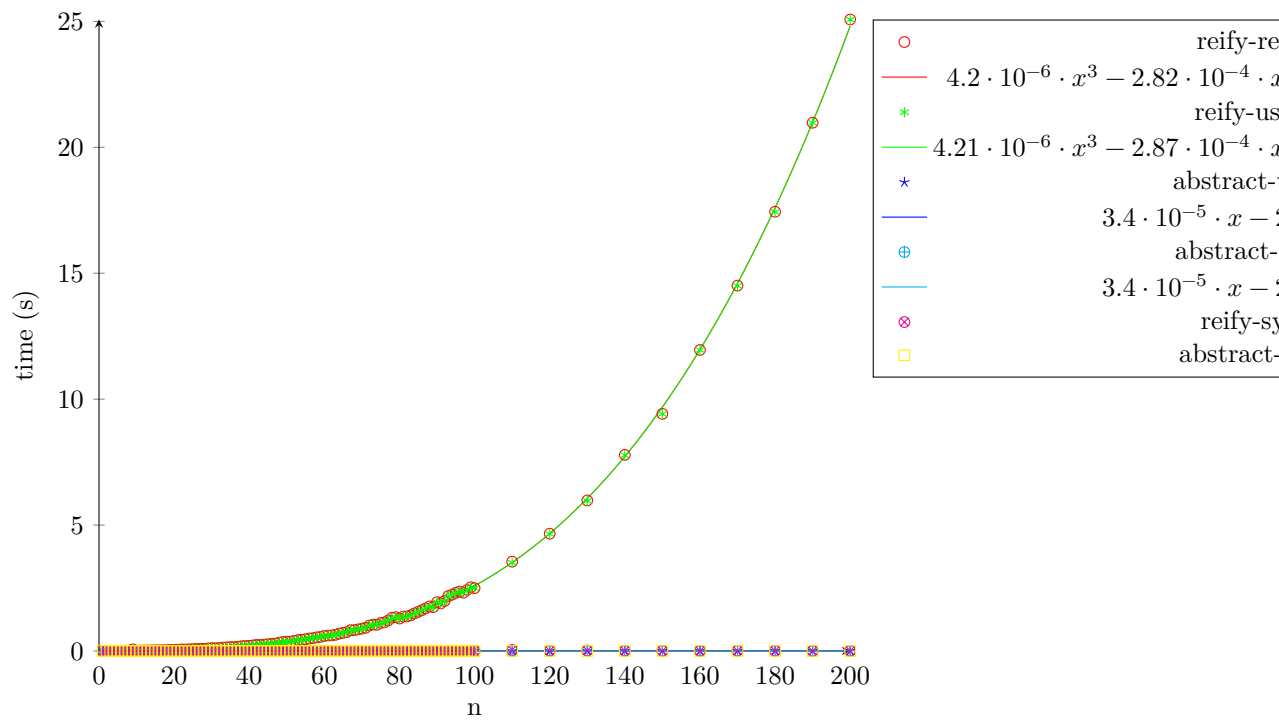Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
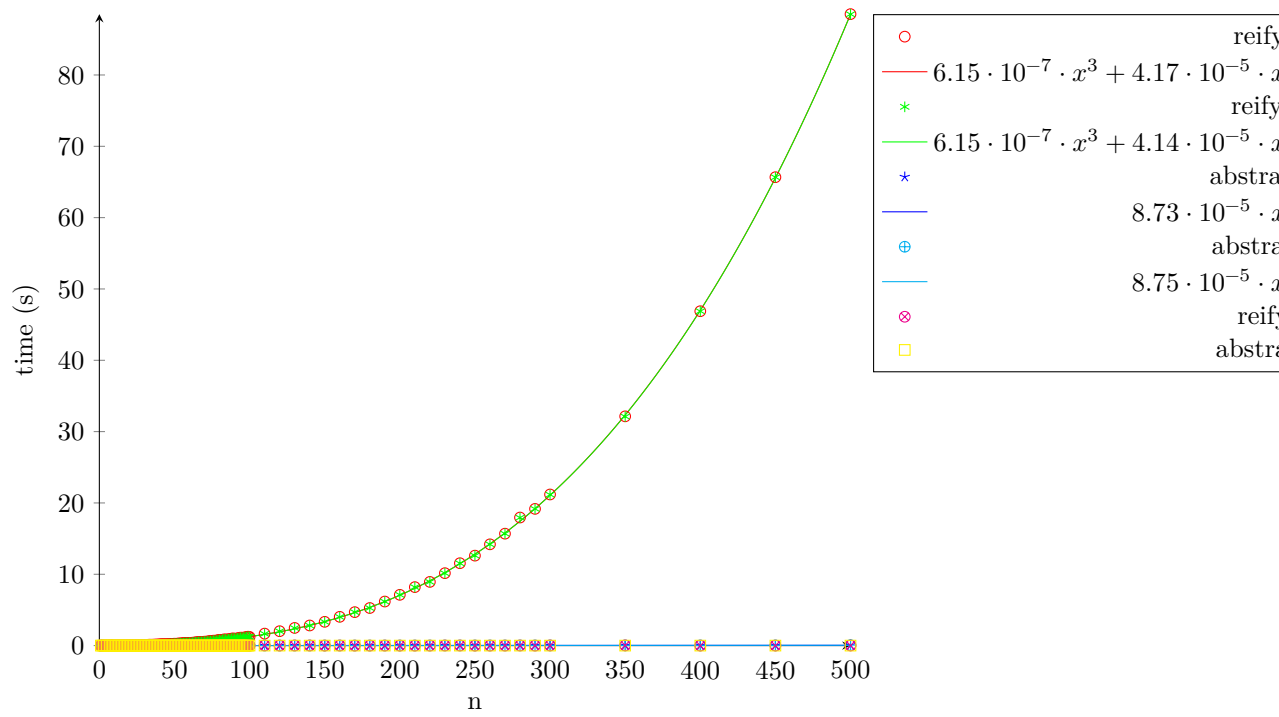
Figure 13: timing-typeclass-reification-let-in-HOAS

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