

Figure 1: timing-pattern

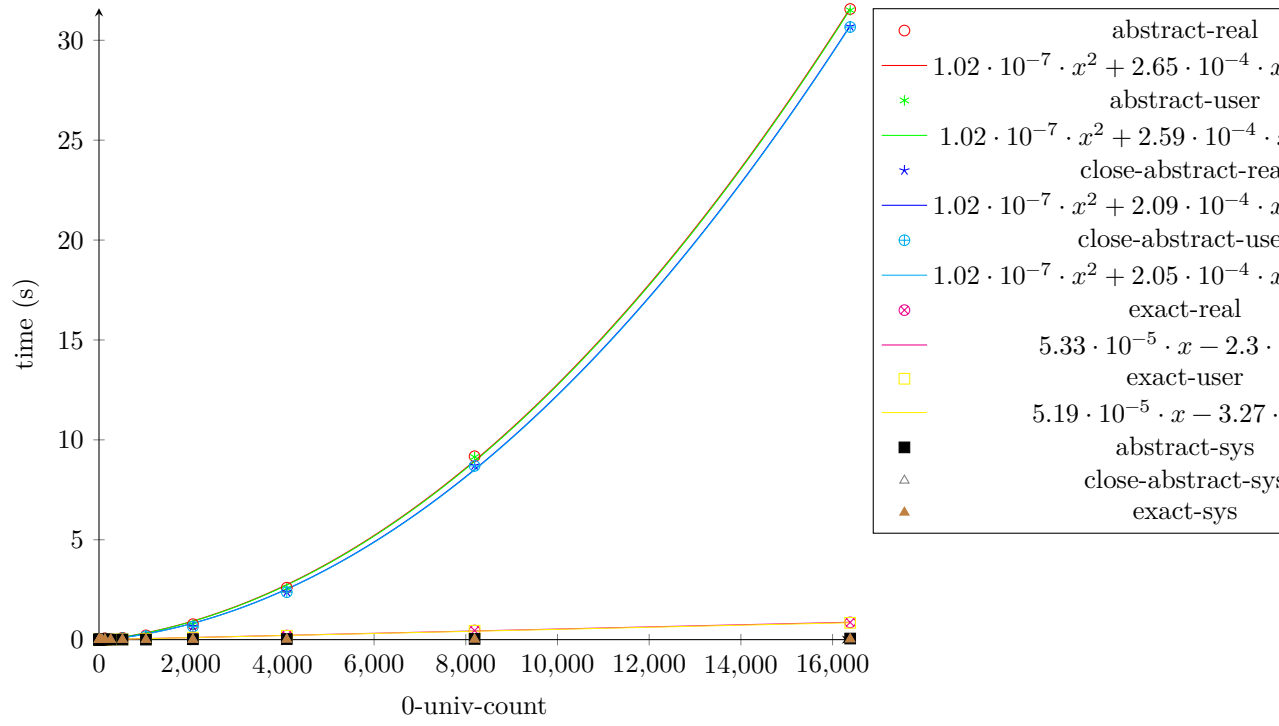


Figure 2: timing-n-polymorphic-universes param-1-n 0

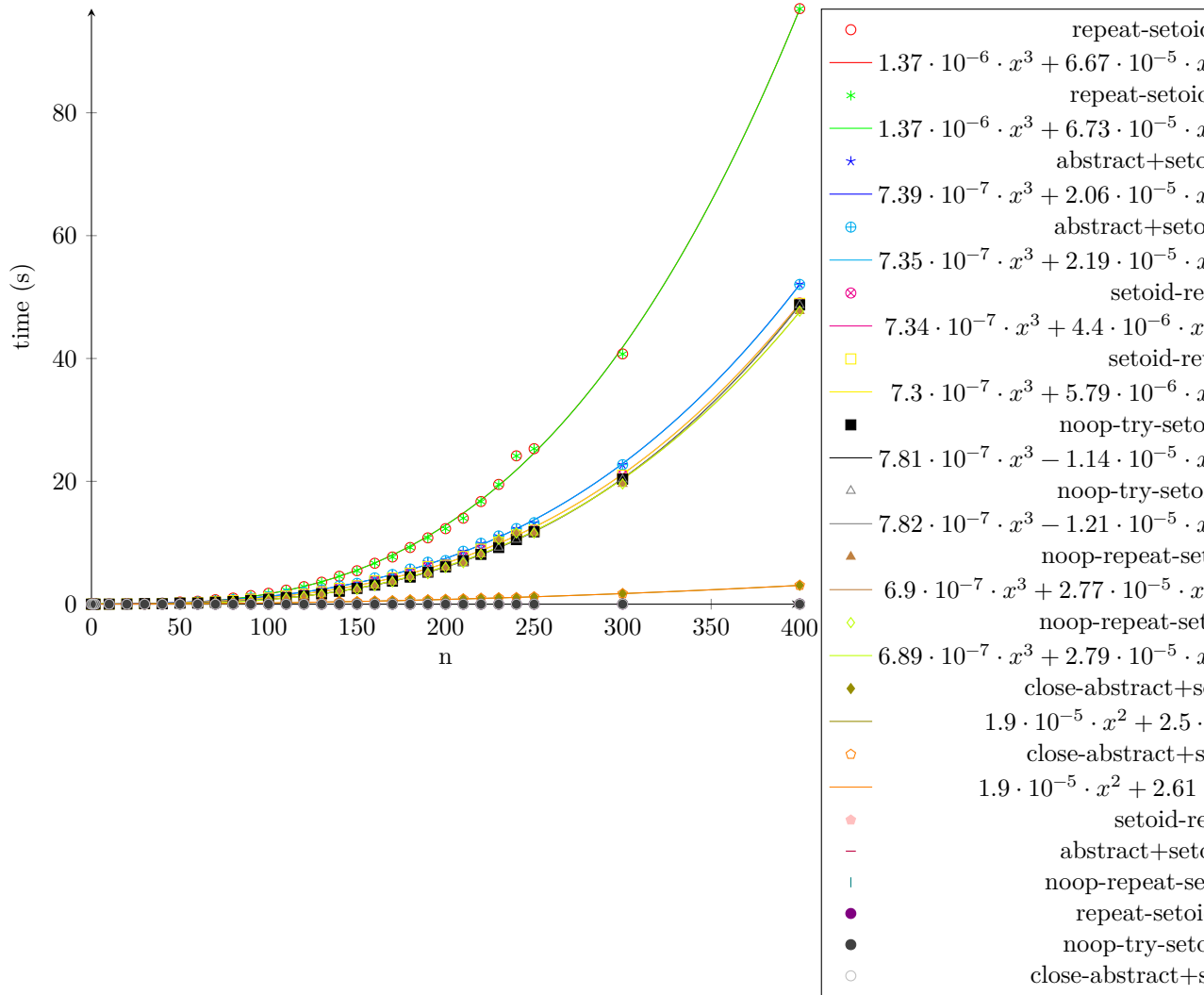


Figure 3: timing-repeat-setoid-rewrite-under-binders

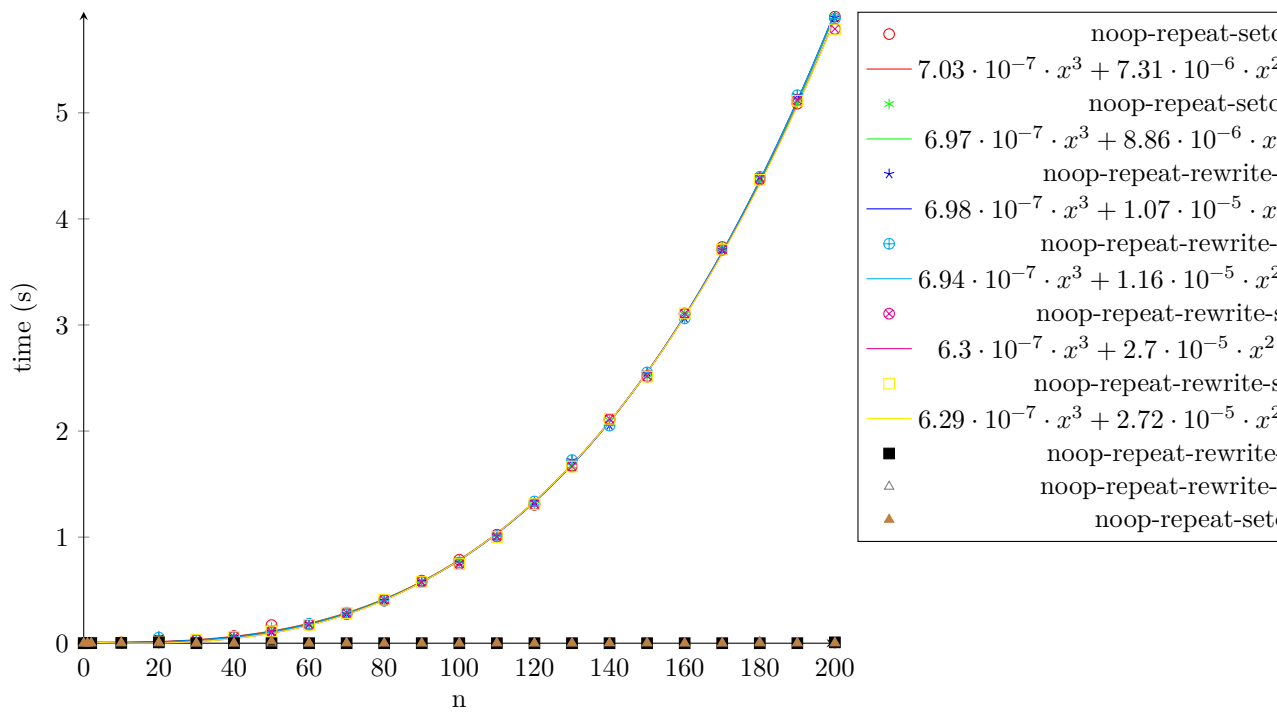


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

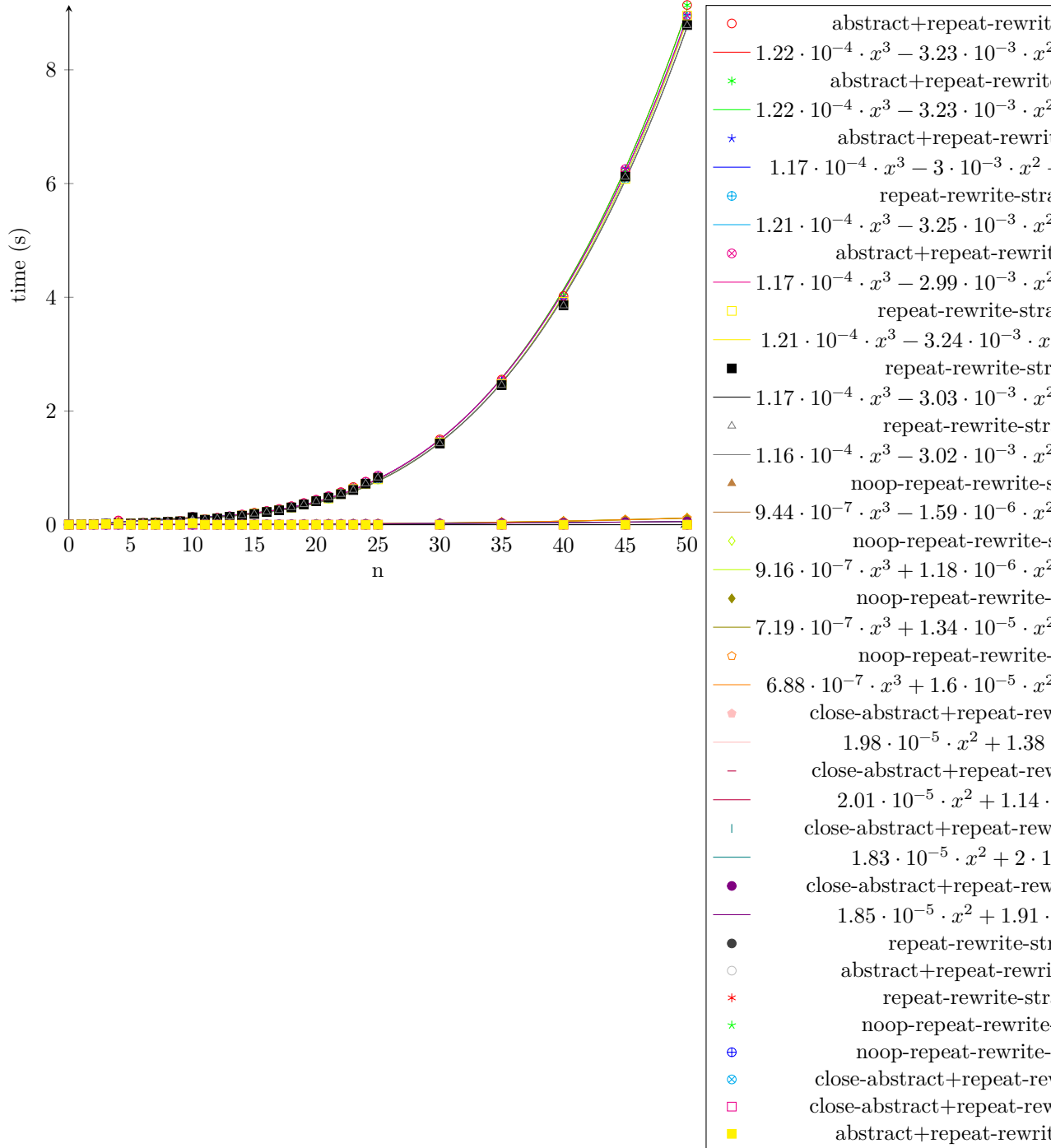


Figure 5: timing-rewrite-strat-under-binders

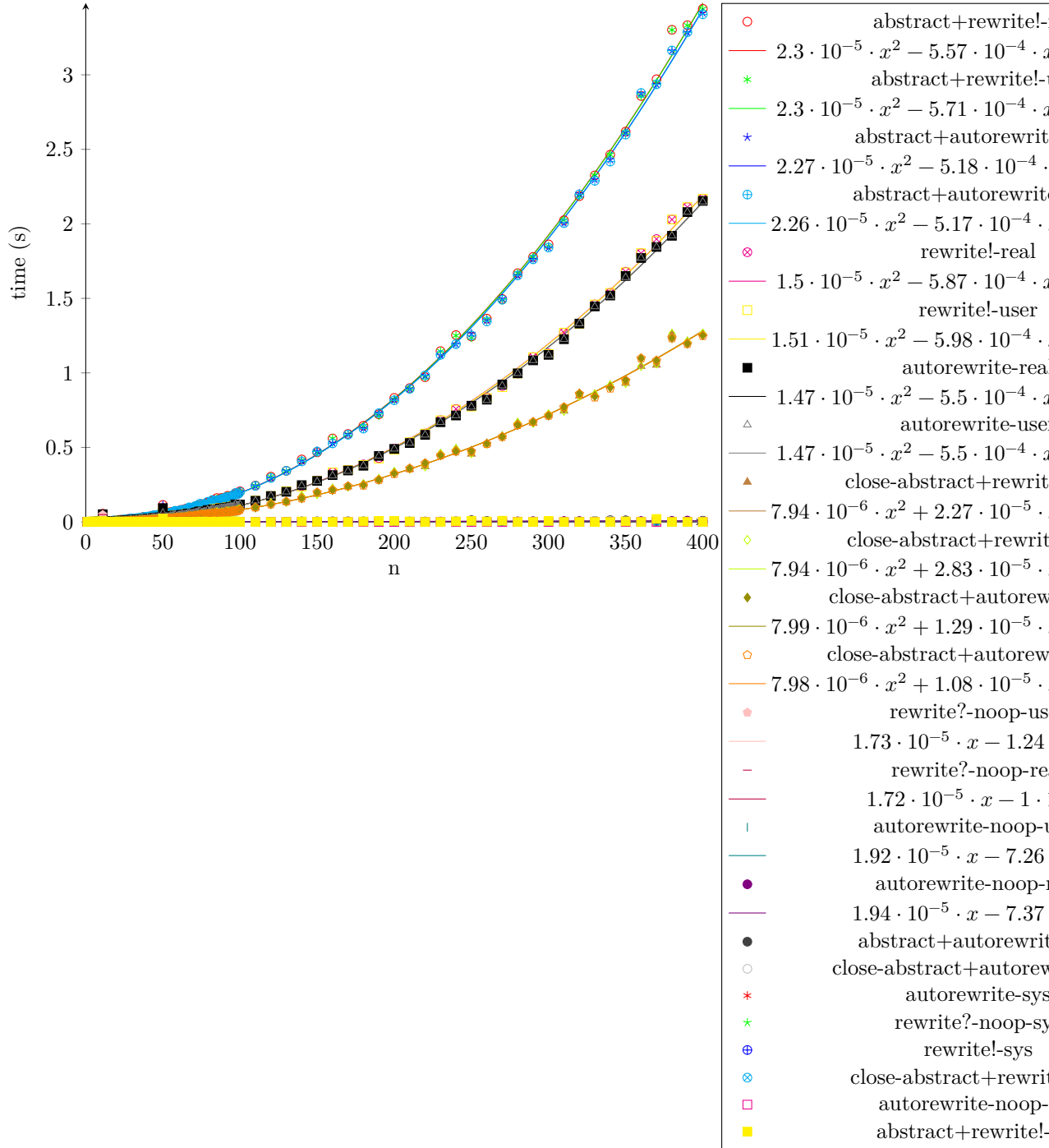


Figure 6: timing-rewrite-repeated-app-autorewrite

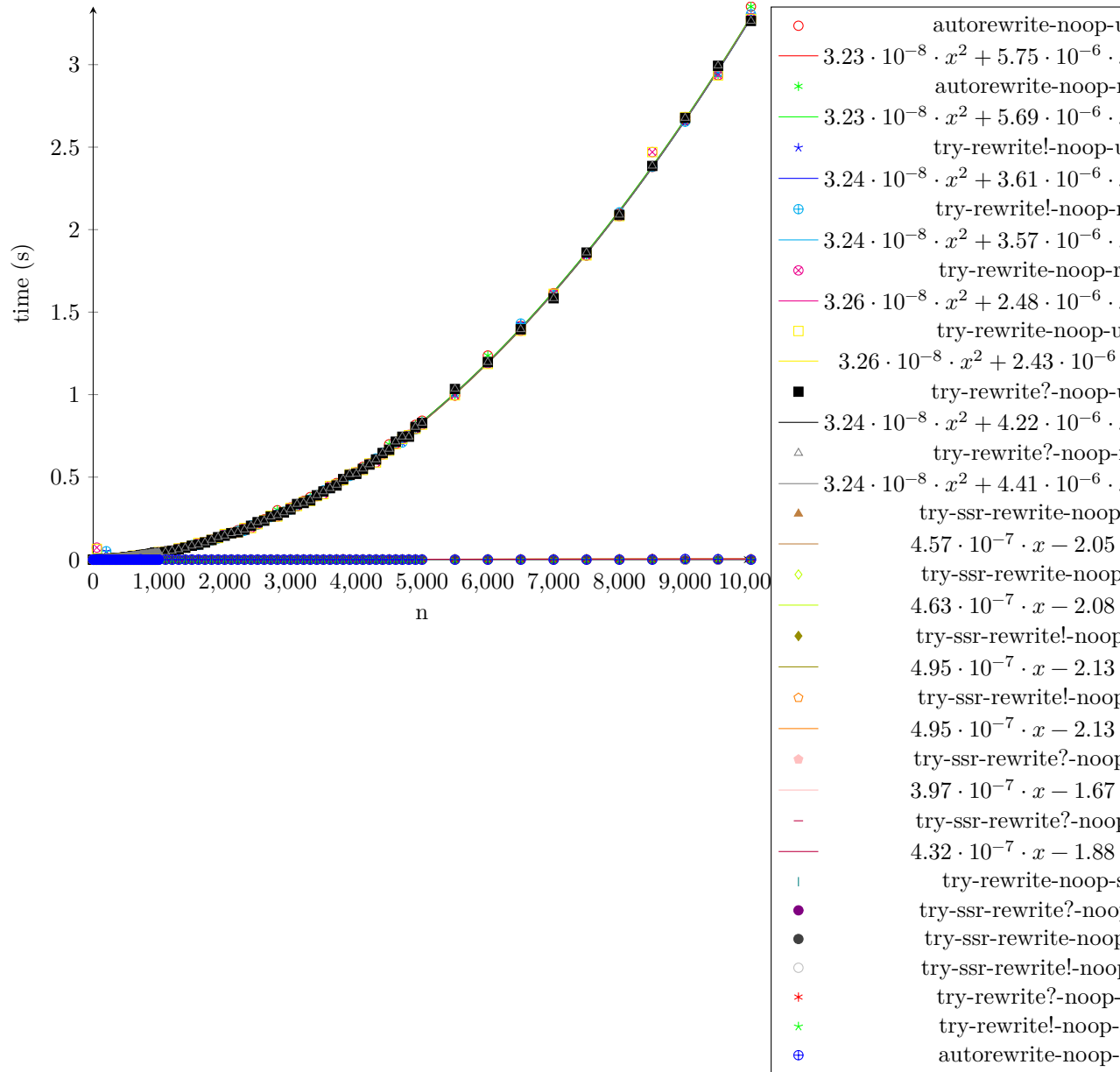


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

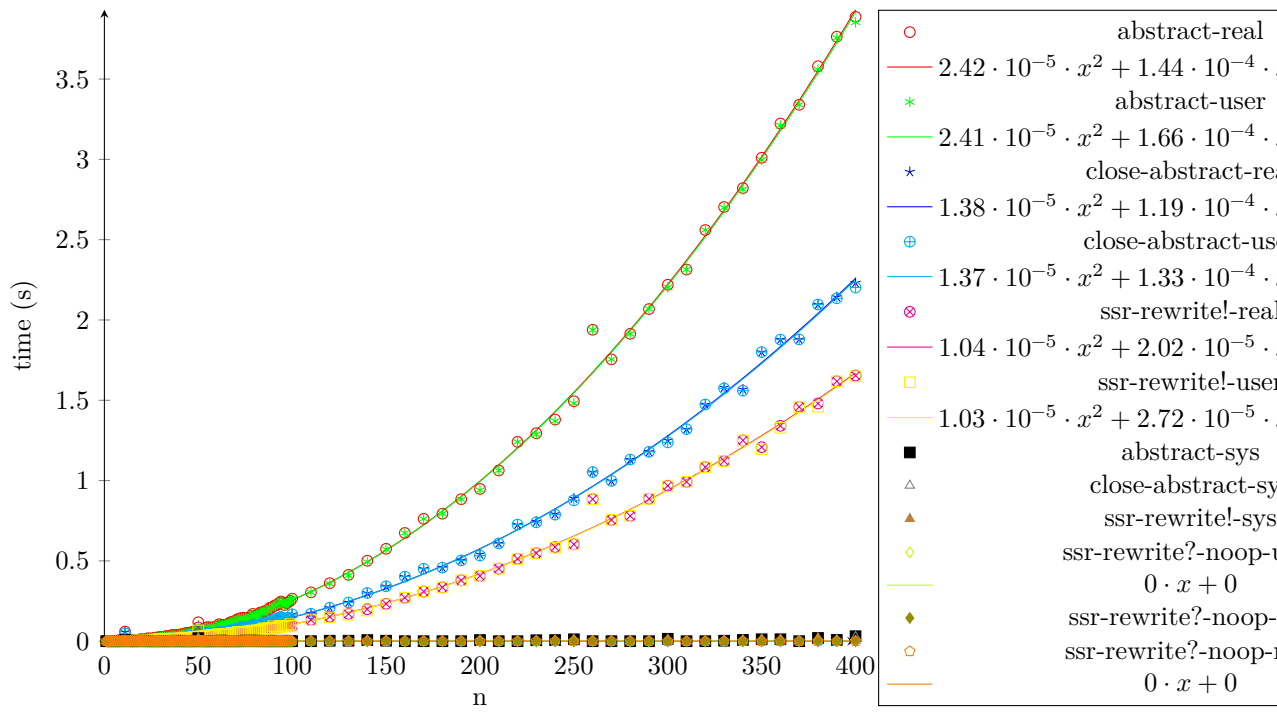


Figure 8: timing-rewrite-repeated-app-ssrrewrite

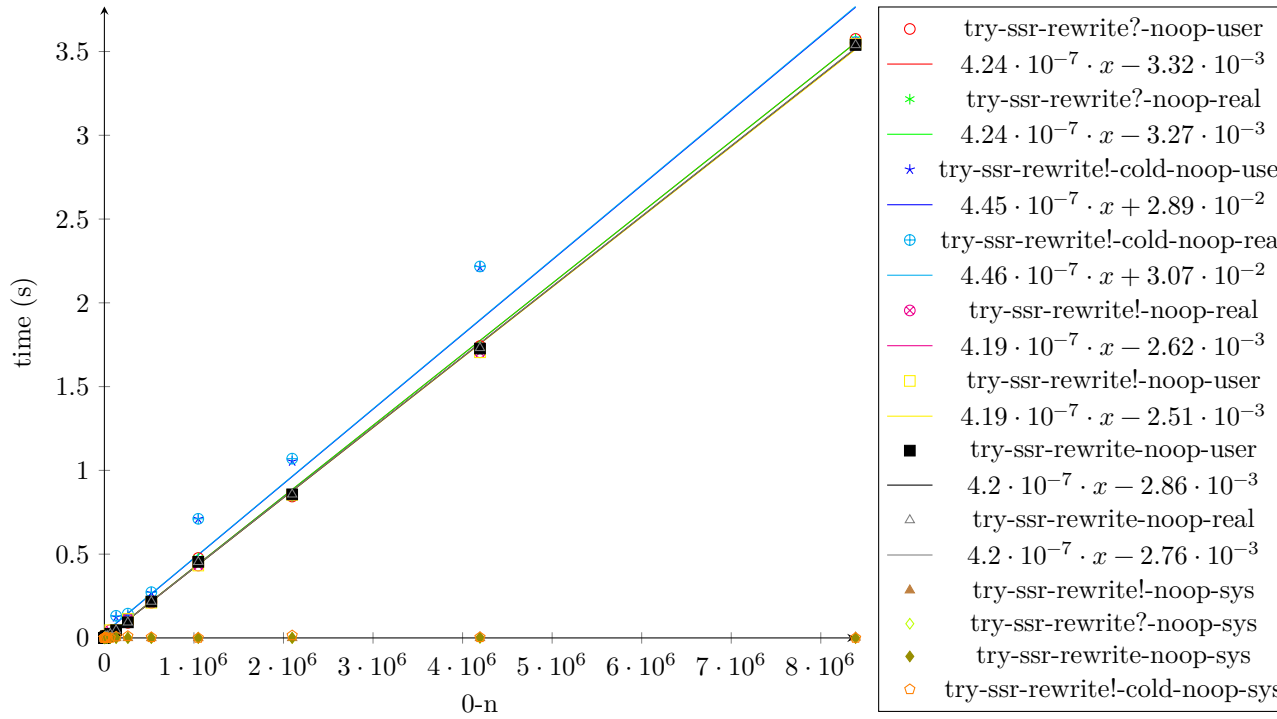


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

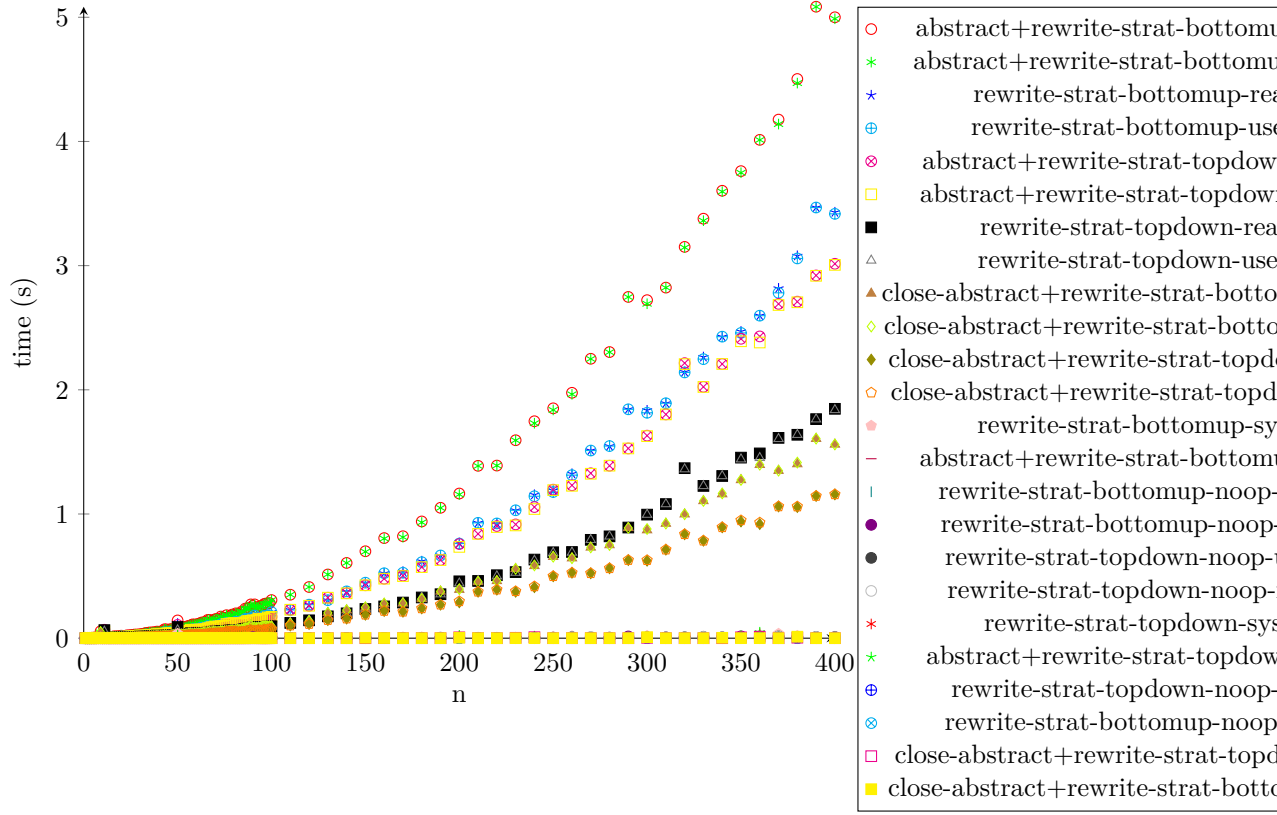


Figure 10: timing-rewrite-repeated-app-rewrite-strat

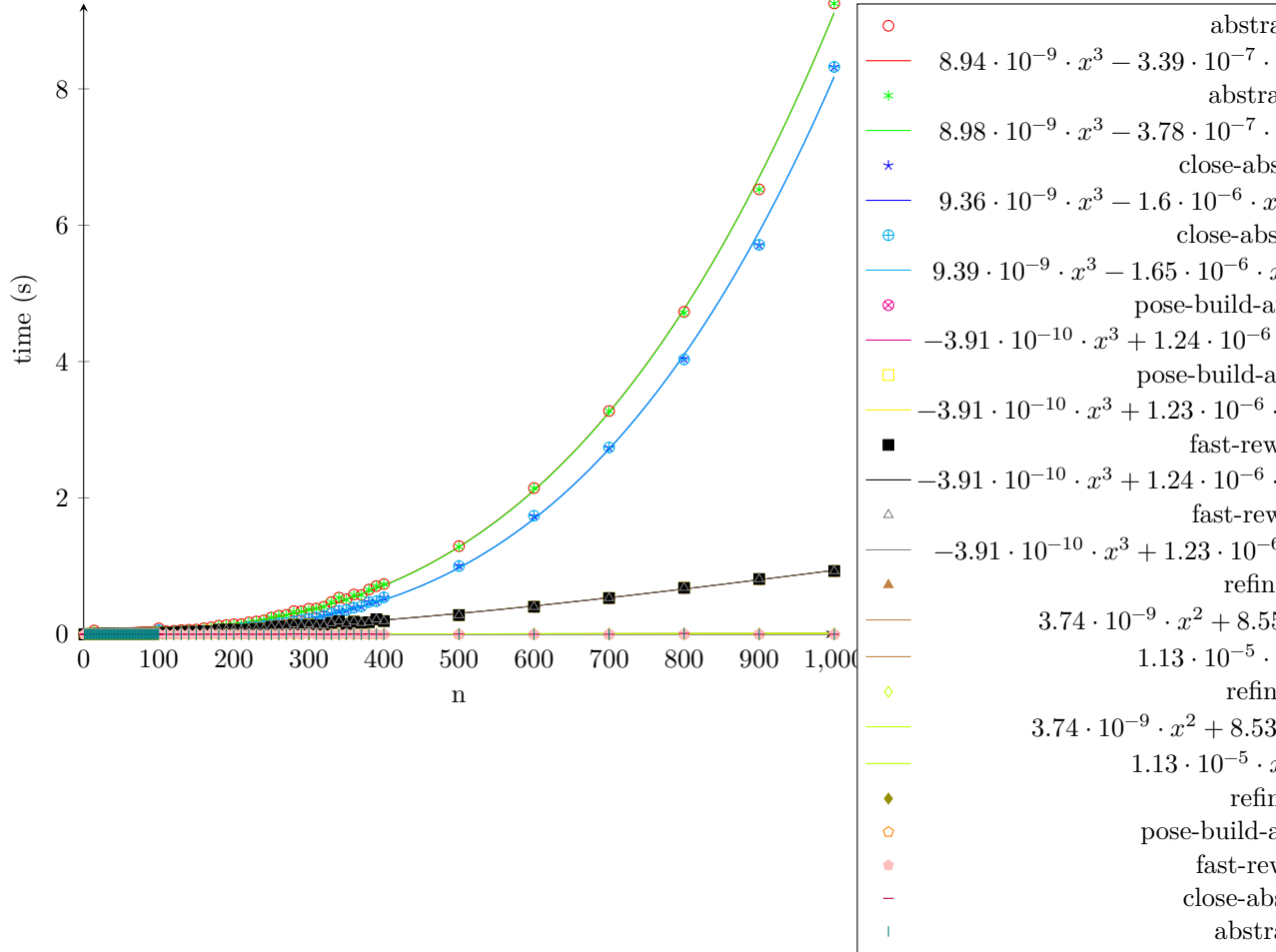


Figure 11: timing-rewrite-repeated-app-fast-rewrite

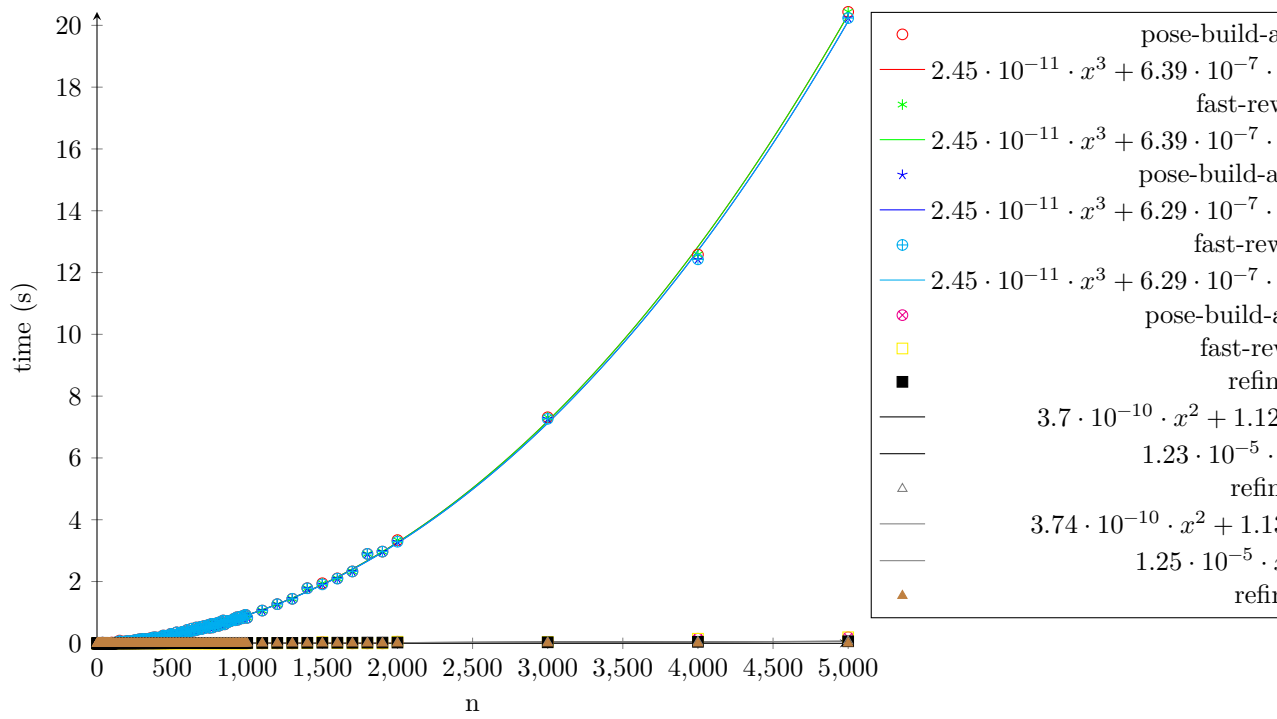


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract

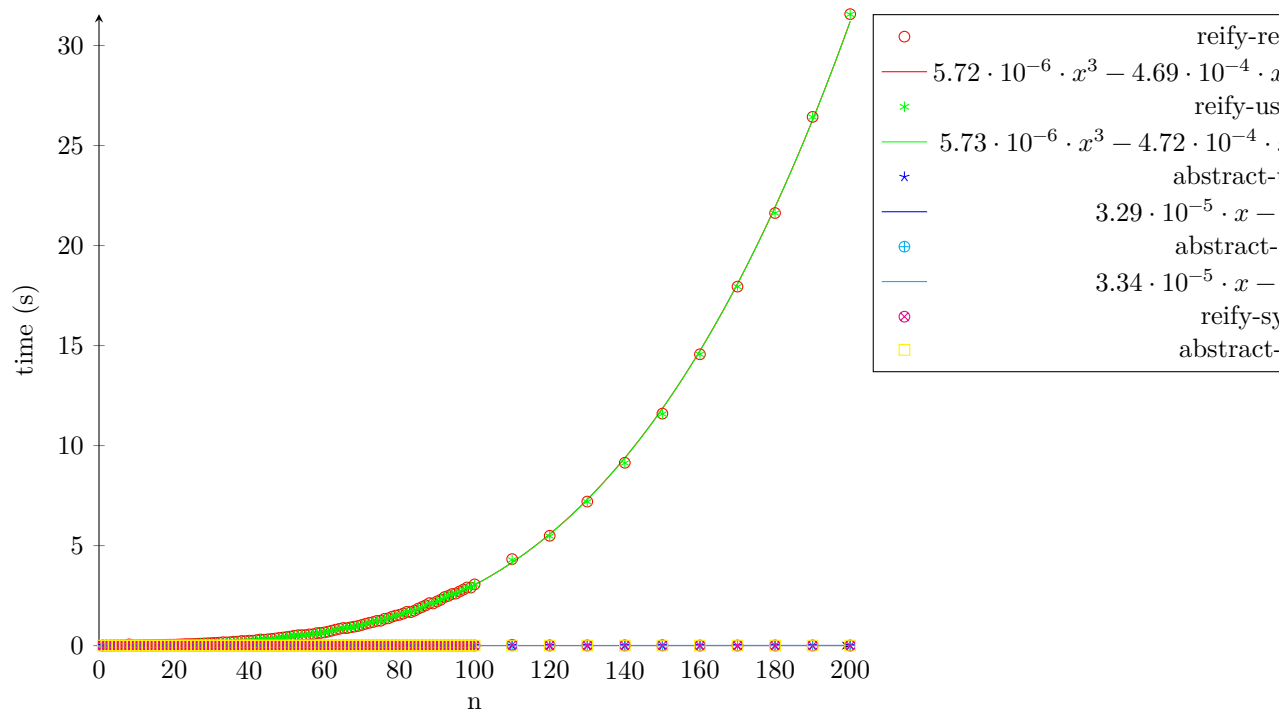


Figure 13: timing-typeclass-reification-let-in-HOAS

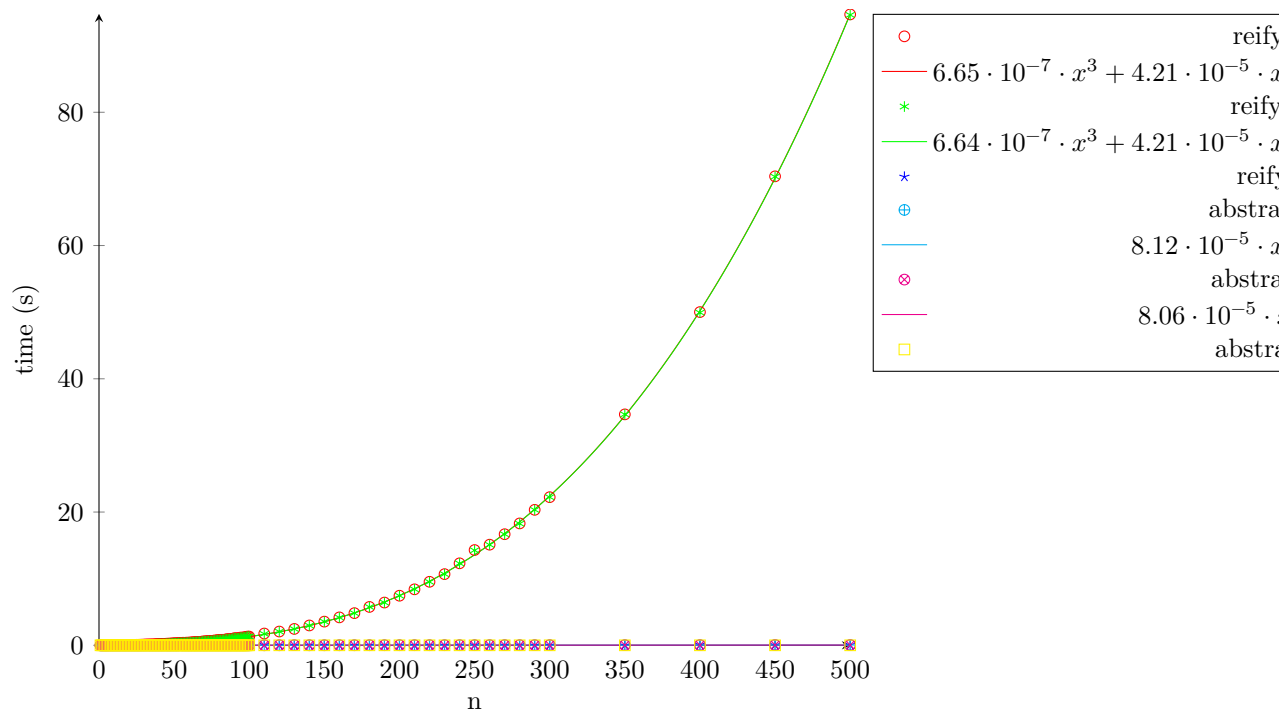
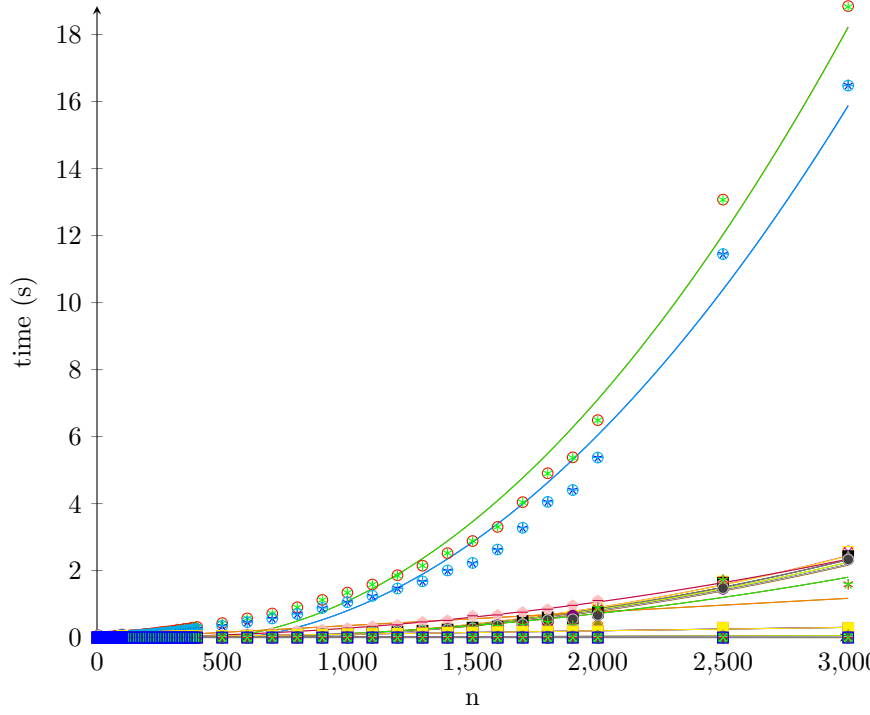


Figure 14: timing-typeclass-reification-let-in-PHOAS



\circ	abstract-real
$2.55 \cdot 10^{-6} \cdot x^2 - 1.62 \cdot 10^{-3}$	
$*$	abstract-user
$2.54 \cdot 10^{-6} \cdot x^2 - 1.62 \cdot 10^{-3}$	
$*$	fast-rewrite-real
$2.3 \cdot 10^{-6} \cdot x^2 - 1.65 \cdot 10^{-3}$	
\oplus	fast-rewrite-user
$2.3 \cdot 10^{-6} \cdot x^2 - 1.65 \cdot 10^{-3}$	
\otimes	type-pf-cast-real
$3.71 \cdot 10^{-7} \cdot x^2 - 3.07 \cdot 10^{-4} \cdot x$	
\square	type-pf-cast-user
$3.69 \cdot 10^{-7} \cdot x^2 - 3.05 \cdot 10^{-4} \cdot x$	
\blacksquare	type-admit-real
$3.53 \cdot 10^{-7} \cdot x^2 - 2.91 \cdot 10^{-4} \cdot x$	
\triangle	type-admit-user
$3.53 \cdot 10^{-7} \cdot x^2 - 2.91 \cdot 10^{-4} \cdot x$	
\blacktriangle	check-admit-cast-u
$3.36 \cdot 10^{-7} \cdot x^2 - 2.66 \cdot 10^{-4} \cdot x$	
\diamond	check-admit-cast-r
$3.36 \cdot 10^{-7} \cdot x^2 - 2.66 \cdot 10^{-4} \cdot x$	
\blacklozenge	refine-user
$3.32 \cdot 10^{-7} \cdot x^2 - 2.82 \cdot 10^{-4} \cdot x$	
$4.07 \cdot 10^{-4} \cdot x - 4.99 \cdot 10^{-5}$	
\circ	refine-real
$3.31 \cdot 10^{-7} \cdot x^2 - 2.81 \cdot 10^{-4} \cdot x$	
$4.07 \cdot 10^{-4} \cdot x - 4.99 \cdot 10^{-5}$	
\bullet	close-abstract-real
$2.5 \cdot 10^{-7} \cdot x^2 + 3.21 \cdot 10^{-5} \cdot x$	
$-$	close-abstract-user
$2.5 \cdot 10^{-7} \cdot x^2 + 3.14 \cdot 10^{-5} \cdot x$	
$ $	type-admit-cast-re
$3.3 \cdot 10^{-7} \cdot x^2 - 2.7 \cdot 10^{-4} \cdot x$	
\bullet	type-admit-cast-us
$3.3 \cdot 10^{-7} \cdot x^2 - 2.7 \cdot 10^{-4} \cdot x$	
\bullet	check-pf-cast-re
$3.31 \cdot 10^{-7} \cdot x^2 - 2.75 \cdot 10^{-4} \cdot x$	
\circ	check-pf-cast-use
$3.31 \cdot 10^{-7} \cdot x^2 - 2.75 \cdot 10^{-4} \cdot x$	
$*$	check-admit-user
$2.43 \cdot 10^{-7} \cdot x^2 - 1.33 \cdot 10^{-4} \cdot x$	
$*$	check-admit-real
$2.43 \cdot 10^{-7} \cdot x^2 - 1.33 \cdot 10^{-4} \cdot x$	
\oplus	build-eval-thunk-re
$1.02 \cdot 10^{-4} \cdot x - 6.86 \cdot 10^{-5}$	
\otimes	build-thunk-real
$1.02 \cdot 10^{-4} \cdot x - 7.61 \cdot 10^{-5}$	
\square	build-eval-thunk-us
$1.02 \cdot 10^{-4} \cdot x - 8.8 \cdot 10^{-5}$	
\blacksquare	build-thunk-user
$1.01 \cdot 10^{-4} \cdot x - 9.18 \cdot 10^{-5}$	
\triangle	check-l-user