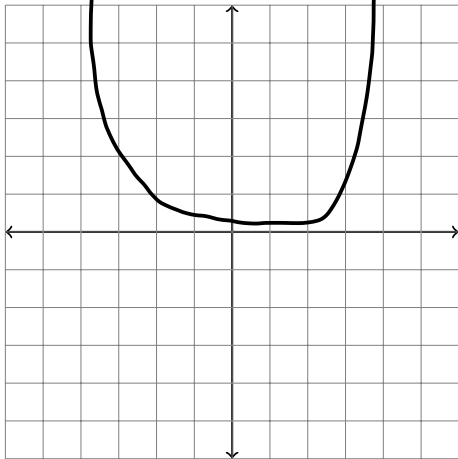


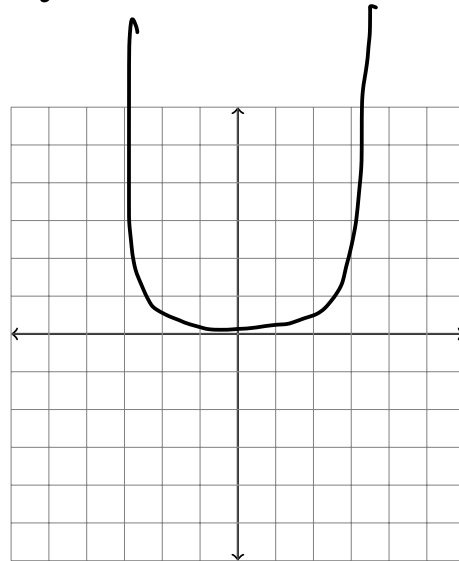
For each kind of the following problems, compute $f(g(x))$ and $f(g(x))$ and plot both.

(a) $f(x) = x^2 + 1$, $g(x) = x^2 + x + 3$

$$f(g(x)) = (x^2 + x + 3)^2 + 1$$

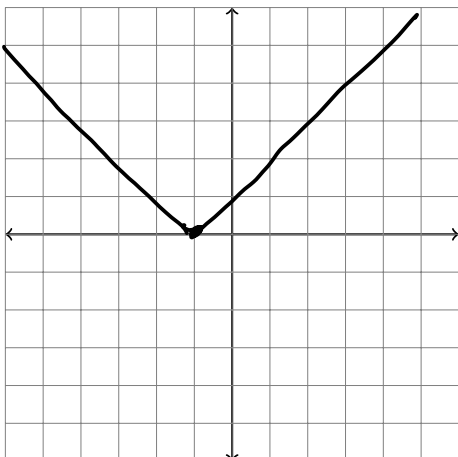


$$g(f(x)) = (x^2 + 1)^2 + (x^2 + 1) + 3$$

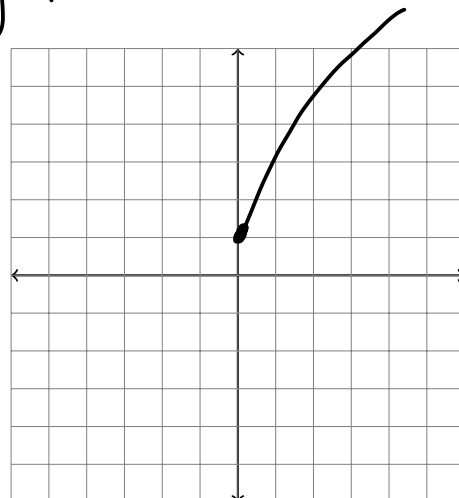


(b) $f(x) = \sqrt{x}$, $g(x) = x^2 + 2x + 1$

$$f(g(x)) = \sqrt{x^2 + 2x + 1}$$



$$g(f(x)) = \sqrt{x}^2 + 2\sqrt{x} + 1$$

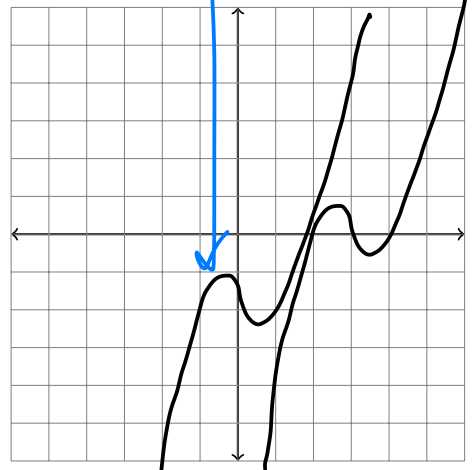
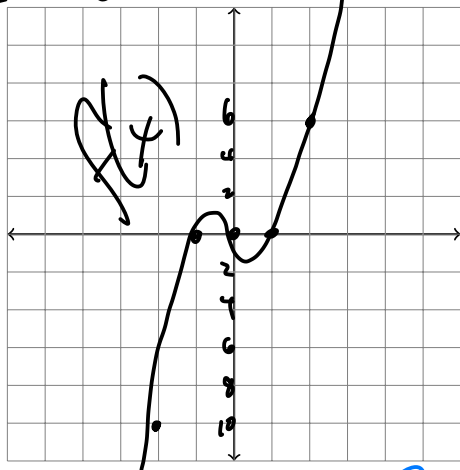


For each of the following, sketch $f(x)$ and then sketch $\ell(f(x))$ and $f(\ell(x))$.

(a) $f(x) = x^3 - x$ and $\ell(x) = x - 3$

x	$x^3 - x$
-2	-10
-1	0
0	0
1	0
2	6

lf down 3
fl right 3

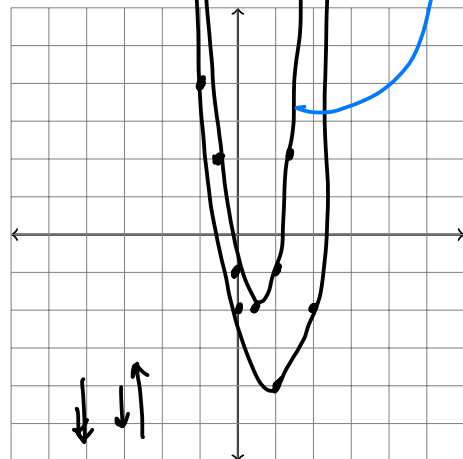
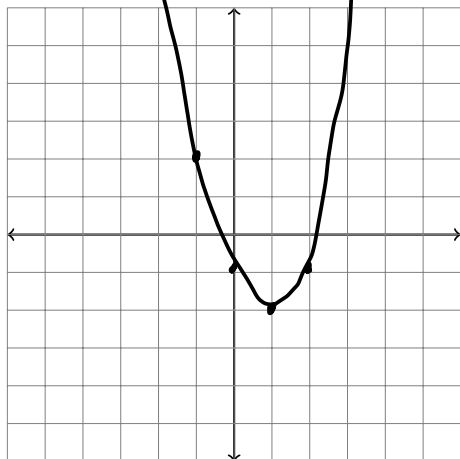


(b) $f(x) = x^2 - 2x - 1$ and $\ell(x) = 2x$

[x2-1

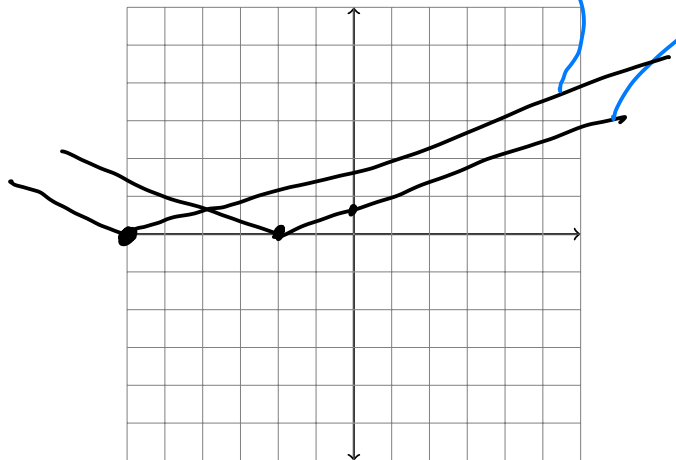
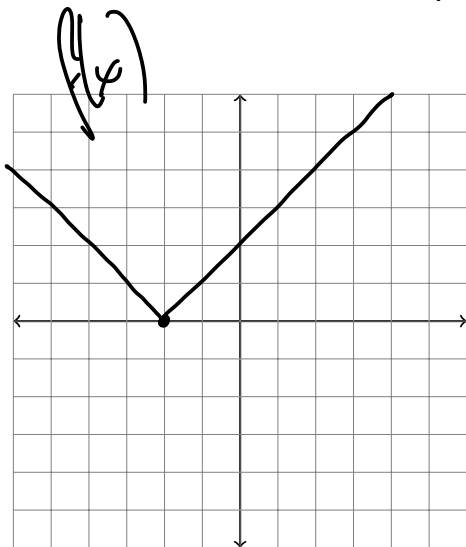
x	$f(x)$
-2	7
-1	2
0	-1
1	-2
2	-1

lf = vert stretch by 2
fl = horizontal stretch by 2



(c) $f(x) = |x + 2|$ and $l(x) = x/3$

$lf =$ went $\frac{1}{3}$ stretch
 $fl =$ horiz $\times 3$ stretch



(d) $f(x) = \sqrt{x^2 + 1}$ and $l(x) = x + 1$

x	f(x)
-2	$\sqrt{5}$
-1	$\sqrt{2}$
0	1
1	$\sqrt{2}$
2	$\sqrt{5}$

$lf =$ up 1
 $fl =$ left 1

