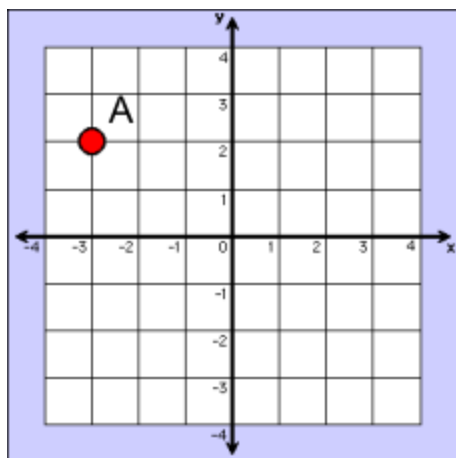


Point transformation

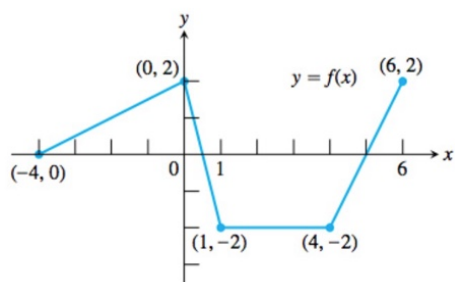


1) The result of shifting the point A five unit to the right and 2 down is a new point B - plot it!

2) The result of reflecting A over the x-axis, vertically shrinking it by $\frac{1}{2}$, shifting it up 3 and shifting it left 1 is a new point C - plot it!

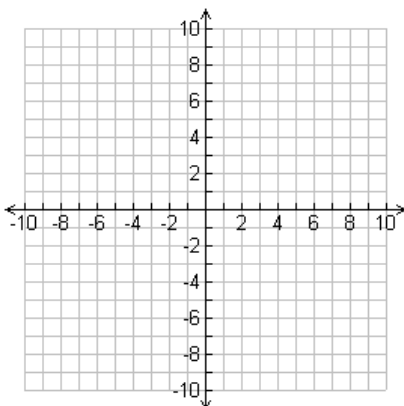
3) Describe transformations that would move point A to a new point D at (2, -4). There is probably more than one way to do this!

Graph transformations

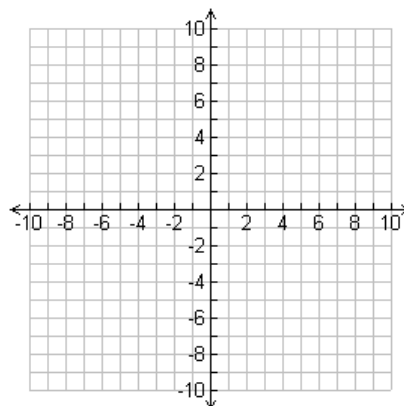


4) The left is the graph of $f(x)$. Sketch the transformed graphs below

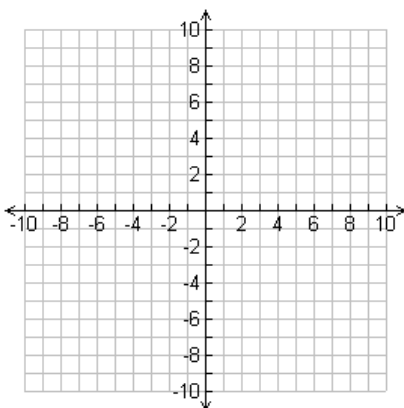
$-f(x)$



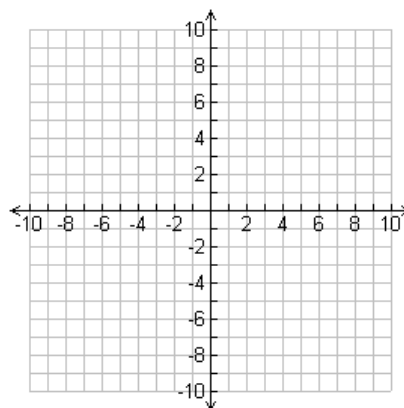
$-4f(x)$



$-4f(x) + 1$



$-4f(x + 3) + 1$



Thinking about transformations

Initial Function	Transformed Function	Transformations
$f(x) = (x - 2)^2 + 4$	$g(x) = (x + 1)^2 + 8$	
$f(x) = 2\sqrt{x + 3}$	$g(x) = 2\sqrt{x} + 5$	
$f(x) = x^3 + 7$		Shifted left 8, shifted down 9
$f(x) = -\sqrt[3]{x - 2}$		Shifted up 4, shifted right 6

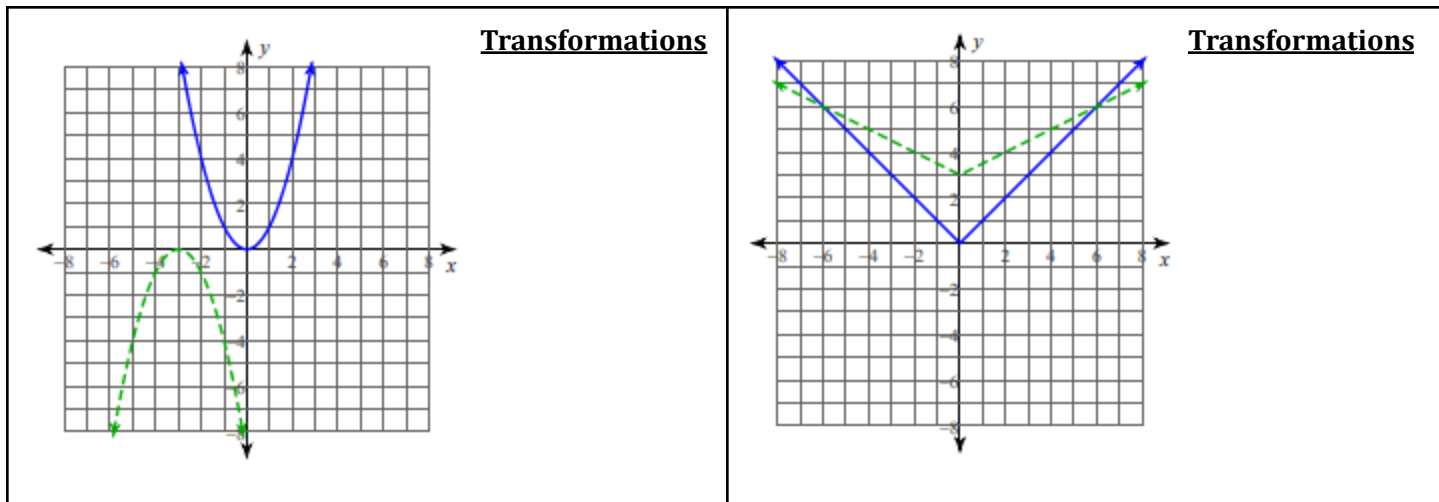
Key features after transformations (Stretch before you shift!)

Key features of $f(x)$	Key features of $f(x - 1) + 2$
Domain: $[-3, 5]$ Range: $[2, 7]$ Increasing: $(-3, -1)$ Decreasing: $(-1, 5)$ Absolute maximum at $x = -1$ with a value of 7	Transformations: _____ _____ Domain: _____ Range: _____ Increasing: _____ Decreasing: _____ Absolute maximum at $x = \underline{\hspace{1cm}}$ with a value of _____

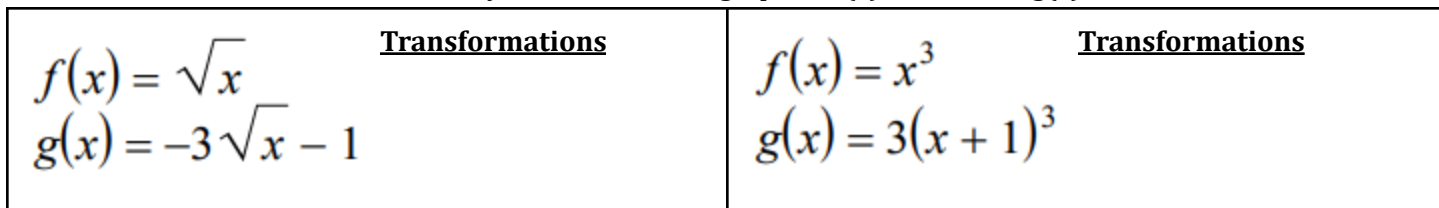
Key features of $f(x)$	Key features of $-2f(x - 1) + 3$
Domain: $(-\infty, \infty)$ Range: $[-3, \infty)$ Increasing: $(4, \infty)$ Decreasing: $(-\infty, 4)$ Absolute minimum at $x = 4$ with a value of 7	Transformations: _____ _____ Domain: _____ Range: _____ Increasing: _____ Decreasing: _____ Absolute _____ at $x = \underline{\hspace{1cm}}$ with a value of _____

Key features of $f(x)$	Key features of $\frac{1}{2}f(x) - 4$
Domain: $[3, \infty)$ Range: $(-\infty, 4]$ Increasing: $(3, \infty)$ Decreasing: Never Absolute minimum at $x = 3$ with a value of 4	Transformations: _____ _____ Domain: _____ Range: _____ Increasing: _____ Decreasing: _____ Absolute _____ at $x = \underline{\hspace{1cm}}$ with a value of _____

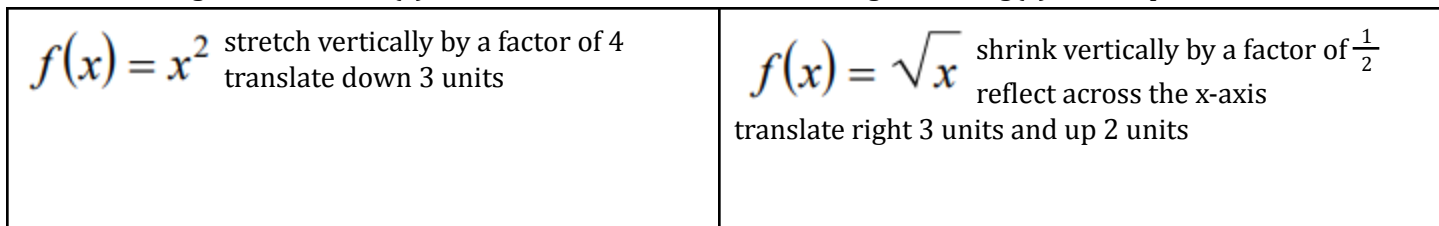
Describe the transformations necessary to transform the graph of $f(x)$ (solid line) into that of $g(x)$ (dashed line)



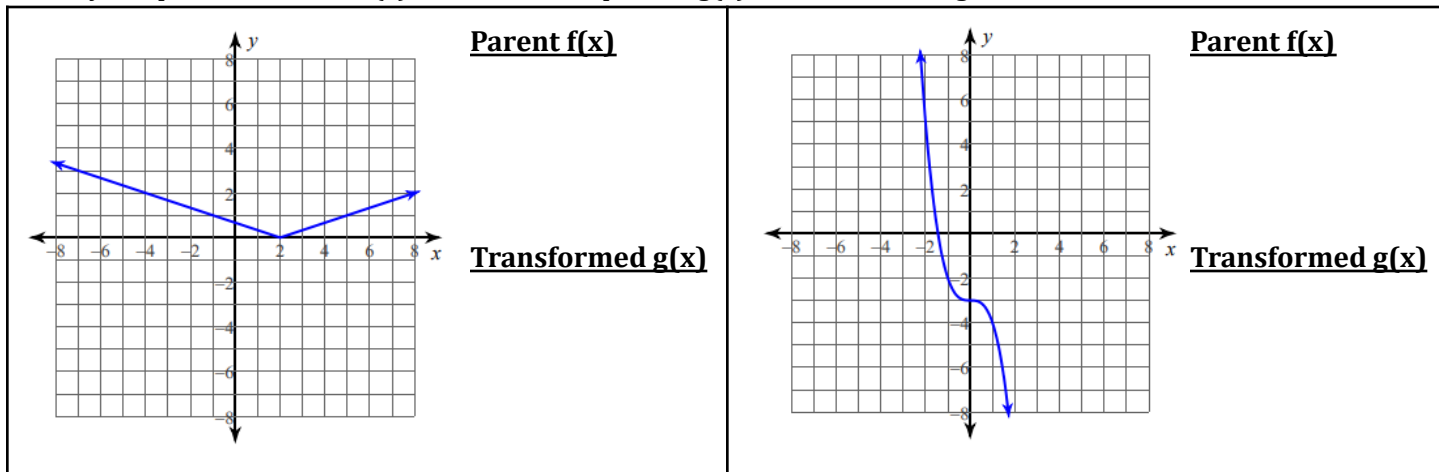
Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.



Transform the given function $f(x)$ as described and write the resulting function $g(x)$ as an equation.



Identify the parent function $f(x)$ and write an equation $g(x)$ for the function given.



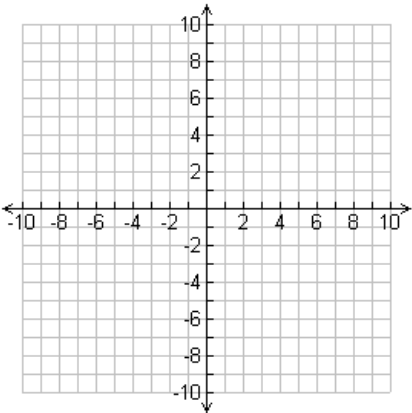
Fill in the table below about transformations

Initial Function	Transformed Function	Transformations
$f(x) = (x - 3)^2 + 5$	$g(x) = (x - 4)^2 - 1$	
$f(x) = 4\sqrt{x} + 6$	$g(x) = 4\sqrt{x - 4}$	
$f(x) = -x^3 + 1$		Shifted right 3, shifted up 4
$f(x) = \sqrt[3]{x - 2}$		Shifted down 2, shifted left 5

Identify the key features of the function after the transformation

Key features of f(x)	Key features of f(x + 3) - 4
Domain: [- 1, 6] Range: [3, 9] Increasing: (-1, 2) Decreasing: (2, 6) Absolute maximum at x = 2 with a value of 9	Transformations: _____ _____ Domain: _____ Range: _____ Increasing: _____ Decreasing: _____ Absolute maximum at x = _____ with a value of _____

Use the table to make a graph of g(x) and answer the questions to the right about the function

$g(x) = -2 x + 4 + 6$	Transformations: _____												
<table><tr><th>x</th><th>g(x)</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> 	x	g(x)											End behavior: _____ _____ Domain: _____ Range: _____ Increasing: _____ Decreasing: _____ abs / rel max / min at: _____ value: _____ x-int: _____ y-int: _____
x	g(x)												