

1.2 Practice B

In Exercises 1–4, write a function g whose graph represents the indicated transformation of the graph of f . Use a graphing calculator to check your answer.

- $f(x) = 5x - 2$; translation 5 units right
 $g(x) = f(x-5) \rightarrow g(x) = 5(x-5) - 2$
 $g(x) = 5x - 27$
- $f(x) = 3x + 6$; translation 4 units up
 $g(x) = f(x) + 4 = 3x + 6 + 4 \rightarrow g(x) = 3x + 10$
- $f(x) = 3 - |x - 2|$; translation 2 units left
 $g(x) = f(x+2) \rightarrow g(x) = 3 - |x+2-2| \rightarrow g(x) = 3 - |x|$
- $f(x) = |2x| + 3$; translation 2 units down
 $g(x) = f(x) - 2 \rightarrow g(x) = |2x| + 3 - 2 \rightarrow g(x) = |2x| + 1$

In Exercises 5–8, write a function g whose graph represents the indicated transformation of the graph of f . Use a graphing calculator to check your answer.

- $f(x) = -x + 3$; reflection in the y -axis
 $g(x) = f(-x) = x + 3$
- $f(x) = \frac{2}{3}x - 4$; reflection in the x -axis
 $g(x) = -f(x) = -(\frac{2}{3}x - 4) \rightarrow g(x) = -\frac{2}{3}x + 4$
- $f(x) = -5 + |x - 8|$; reflection in the y -axis
 $g(x) = f(-x) = -5 + |-x - 8|$
- $f(x) = |4x - 1| + 2$; reflection in the y -axis
 $g(x) = f(-x) = |-4x - 1| + 2$

In Exercises 9–12, write a function g whose graph represents the indicated transformation of the graph of f . Use a graphing calculator to check your answer.

- $f(x) = 3 - x$; horizontal stretch by a factor of 2
 $g(x) = f(\frac{1}{2}x) = 3 - \frac{1}{2}x$
- $f(x) = 3x + 5$; vertical shrink by a factor of $\frac{1}{3}$
 $g(x) = \frac{1}{3}f(x) = \frac{1}{3}(3x + 5) \rightarrow g(x) = x + \frac{5}{3}$
- $f(x) = |3x| + 2$; horizontal shrink by a factor of $\frac{1}{3}$
 $g(x) = f(3x) = |3(3x)| + 2 \rightarrow g(x) = |9x| + 2$
- $f(x) = -2|x - 2| + 4$; vertical stretch by a factor of 2
 $g(x) = 2f(x) = 2(-2|x - 2| + 4) \rightarrow g(x) = -4|x - 2| + 8$

In Exercises 13 and 14, write a function g whose graph represents the indicated transformation of the graph of f .

- $f(x) = x$; translation 5 units up followed by a vertical shrink by a factor of $\frac{1}{4}$
 $g(x) = \frac{1}{4}(f(x) + 5) \rightarrow g(x) = \frac{1}{4}x + \frac{5}{4}$
- $f(x) = |x|$; reflection in the x -axis followed by a translation 2 units left
 $g(x) = -f(x) = -|x|$
 $g(x) = -f(x+2) = -|x+2|$