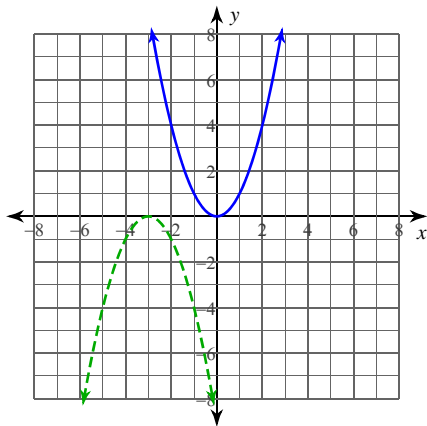Name_____

Transformations of Graphs
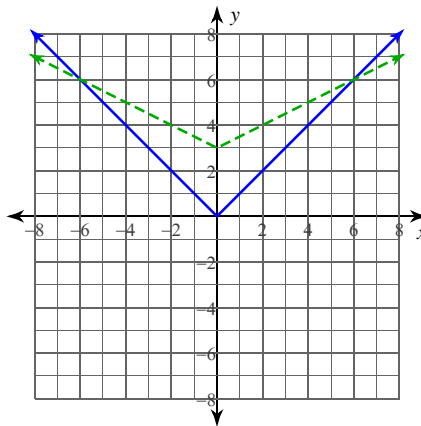
Date_____ Period_____

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

1)

2)

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

3) $f(x) = \sqrt{x}$
   $g(x) = -3\sqrt{x} - 1$

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

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

5) $f(x) = x^2$
   expand vertically by a factor of 3
   translate down 3 units

6) $f(x) = \dfrac{1}{x}$
   compress horizontally by a factor of 2
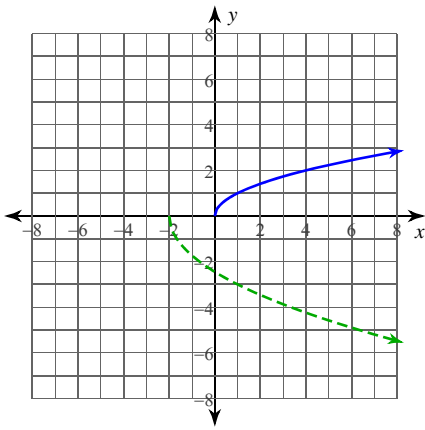   translate left 3 units

7) $f(x) = |x|$
   expand horizontally by a factor of 2
   translate right 1 unit
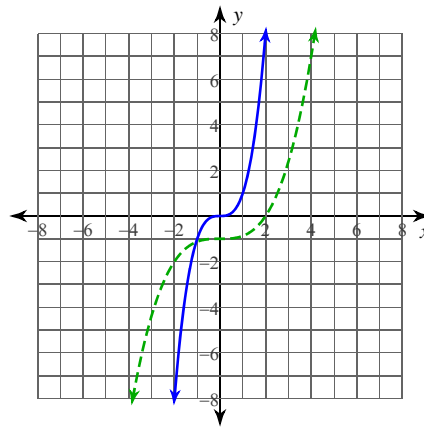   translate up 3 units

8) $f(x) = \sqrt{x}$
   compress vertically by a factor of 3
   reflect across the x-axis
   translate right 2 units
   translate down 3 units

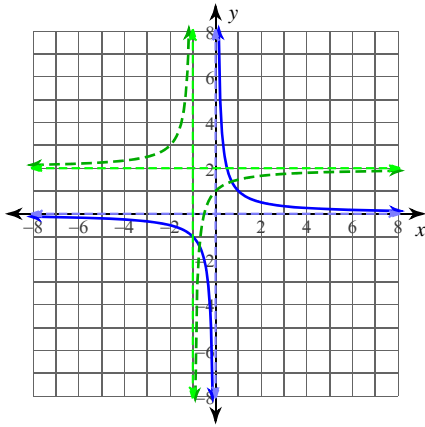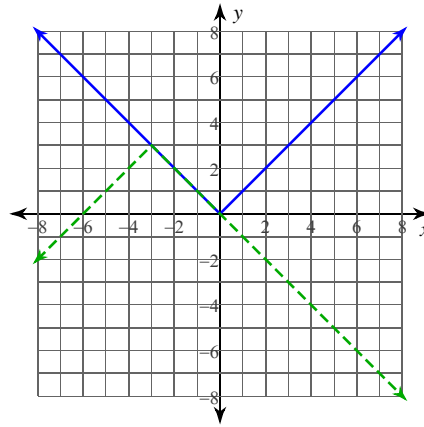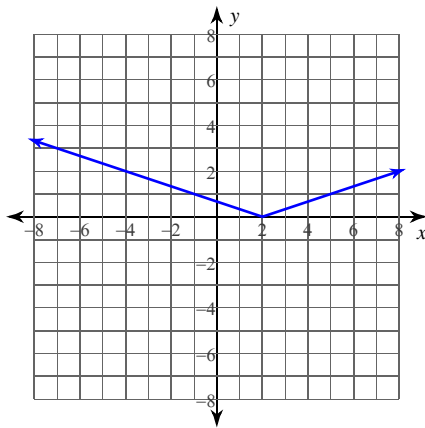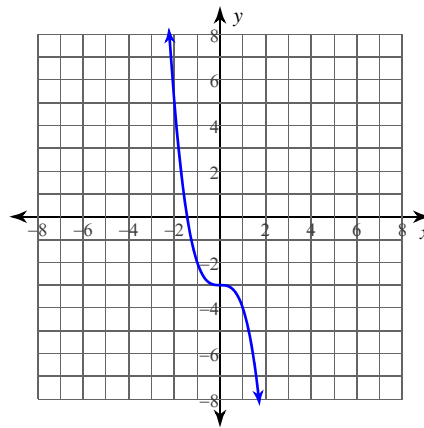**Write $g(x)$ (dashed line) in terms of $f(x)$ (solid line).**

9)

10)

11)

12)

Identify the parent function $f(x)$ and write an equation for the function given.
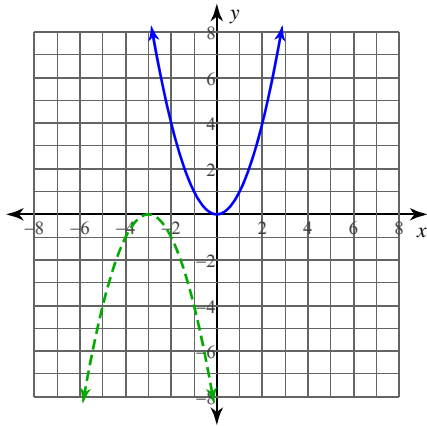
13)

14)

Name_____

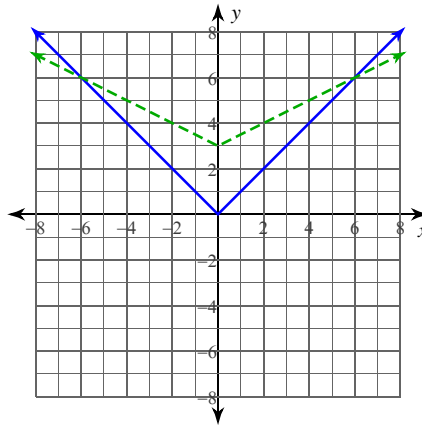# Transformations of Graphs

Date_____ Period____

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

1)

reflect across the x-axis
translate left 3 units

2)

compress vertically by a factor of 2
translate up 3 units

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

3) $f(x) = \sqrt{x}$
$g(x) = -3\sqrt{x} - 1$

expand vertically by a factor of 3
reflect across the x-axis
translate down 1 unit

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

expand vertically by a factor of 3
translate left 1 unit

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

5) $f(x) = x^2$
expand vertically by a factor of 3
translate down 3 units

$g(x) = 3x^2 - 3$

6) $f(x) = \dfrac{1}{x}$

compress horizontally by a factor of 2
translate left 3 units

$g(x) = \dfrac{1}{2(x+3)}$

7) $f(x) = |x|$
expand horizontally by a factor of 2
translate right 1 unit
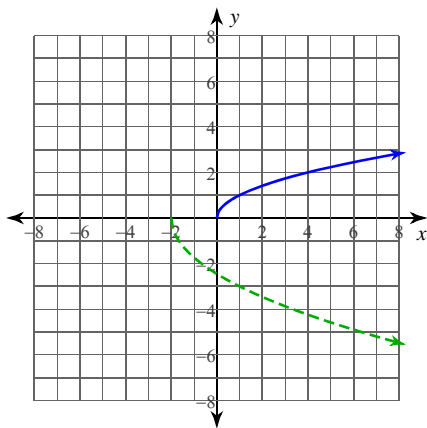translate up 3 units

$g(x) = \left| \dfrac{1}{2}(x-1) \right| + 3$

8) $f(x) = \sqrt{x}$
compress vertically by a factor of 3
reflect across the x-axis
translate right 2 units
translate down 3 units

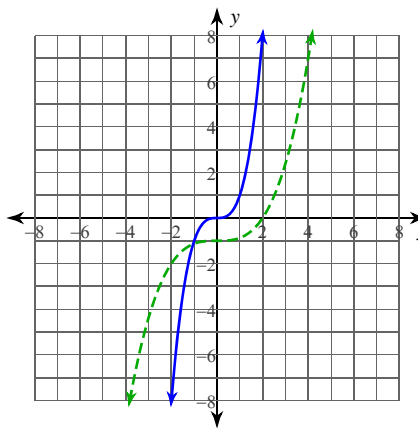$g(x) = -\dfrac{1}{3}\sqrt{x-2} - 3$

Write $g(x)$ (dashed line) in terms of $f(x)$ (solid line).
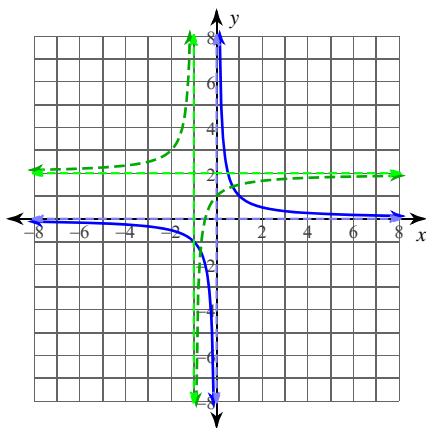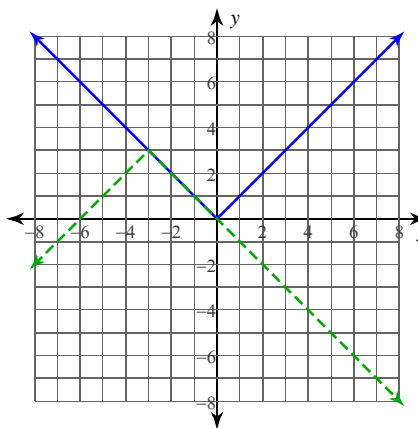
9)

$$g(x) = -f(3(x+2))$$

10)

$$g(x) = f\left(\frac{1}{2}x\right) - 1$$
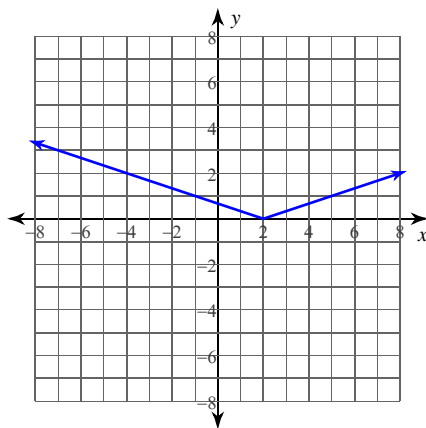
11)

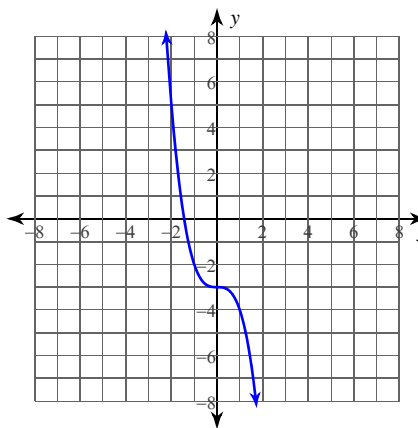$$g(x) = -f(x+1) + 2$$

12)

$$g(x) = -f(x+3) + 3$$

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

13)

Parent: $f(x) = |x|$

$$g(x) = \left|\frac{1}{3}(x-2)\right|$$

14)

Parent: $f(x) = x^3$

$$g(x) = -x^3 - 3$$