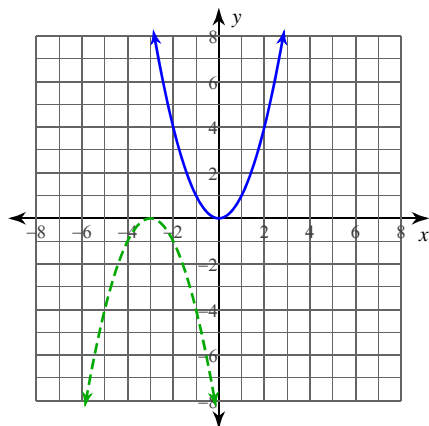


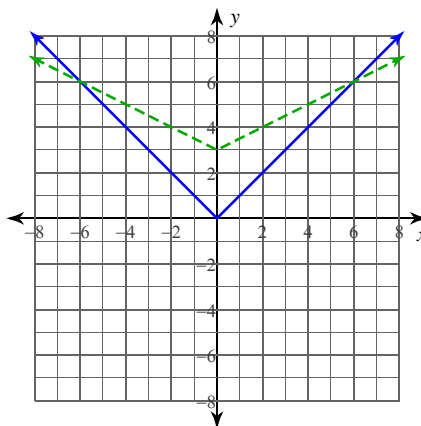
Transformations of Graphs

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 $g(x)$.

$$3) \quad f(x) = \sqrt{x}$$

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

$$4) \quad f(x) = x^3$$

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

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

$$5) \quad f(x) = x^2$$

expand vertically by a factor of 3
translate down 3 units

$$6) \quad f(x) = \frac{1}{x}$$

compress horizontally by a factor of 2
translate left 3 units

$$7) \quad f(x) = |x|$$

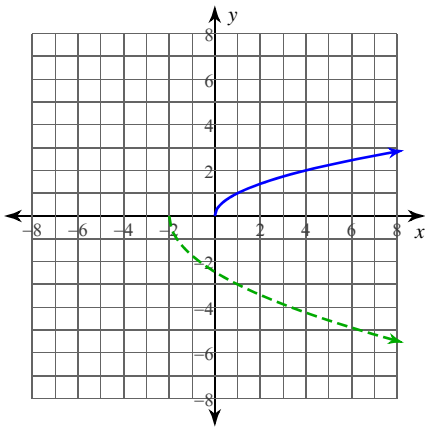
expand horizontally by a factor of 2
translate right 1 unit
translate up 3 units

$$8) \quad f(x) = \sqrt{x}$$

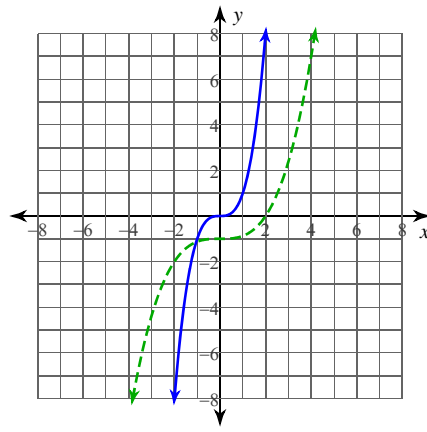
compress vertically by a factor of 3
reflect across the x-axis
translate right 2 units
translate down 3 units

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

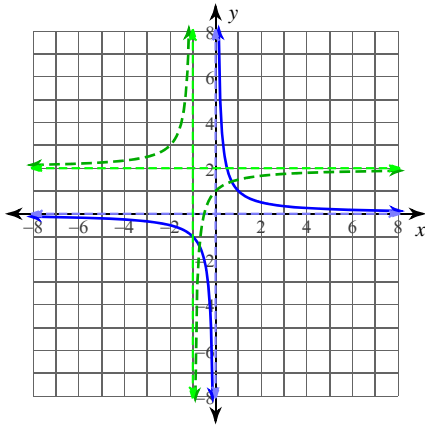
9)



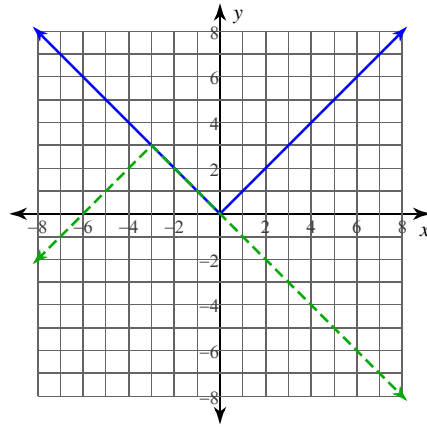
10)



11)

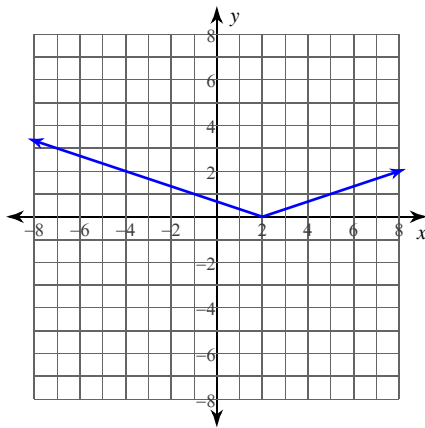


12)

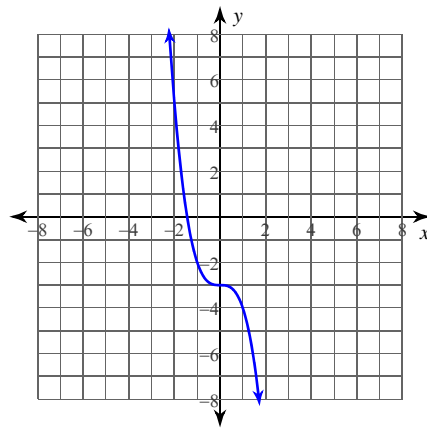


Identify the parent function $f(x)$ and write an equation for the function given.

13)



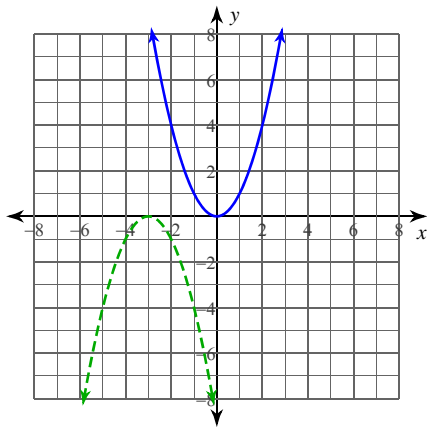
14)



Transformations of Graphs

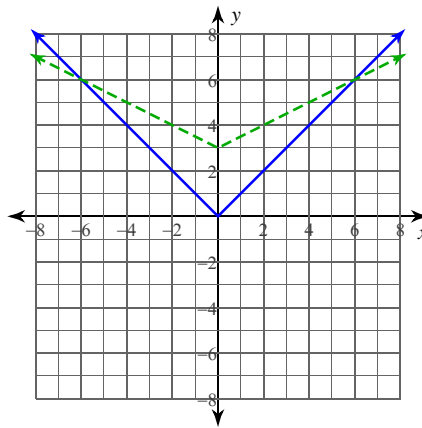
Describe the transformations necessary to transform the graph of $f(x)$ (solid line) into that of $g(x)$ (dashed line).

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 $g(x)$.

$$3) \quad f(x) = \sqrt{x}$$

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

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

$$4) \quad f(x) = x^3$$

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

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.

$$5) \quad f(x) = x^2$$

expand vertically by a factor of 3
translate down 3 units

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

$$6) \quad f(x) = \frac{1}{x}$$

compress horizontally by a factor of 2
translate left 3 units

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

$$7) \quad f(x) = |x|$$

expand horizontally by a factor of 2
translate right 1 unit
translate up 3 units

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

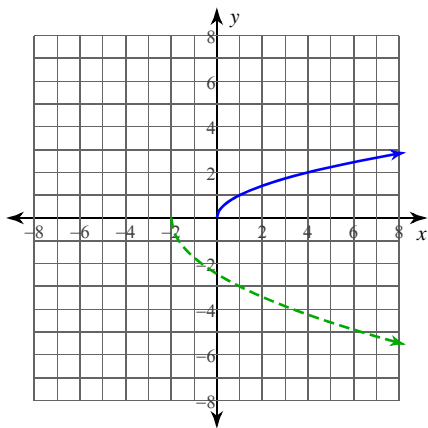
$$8) \quad f(x) = \sqrt{x}$$

compress vertically by a factor of 3
reflect across the x-axis
translate right 2 units
translate down 3 units

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

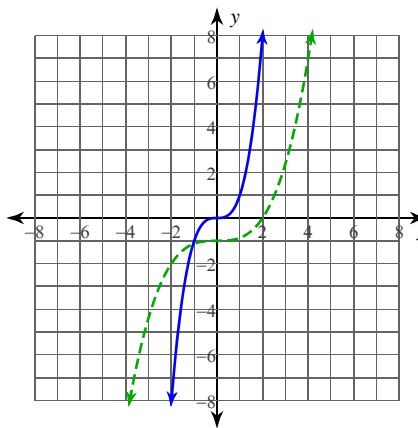
Write $g(x)$ (dashed line) in terms of $f(x)$ (solid line).

9)



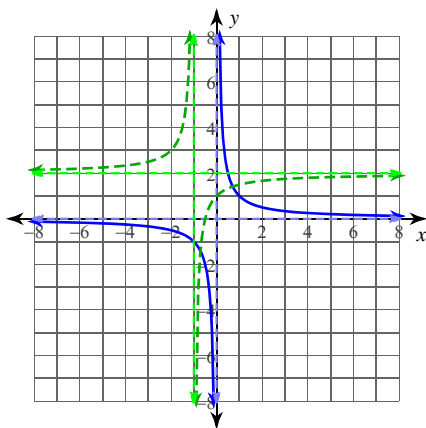
$$g(x) = -f(3(x+2))$$

10)



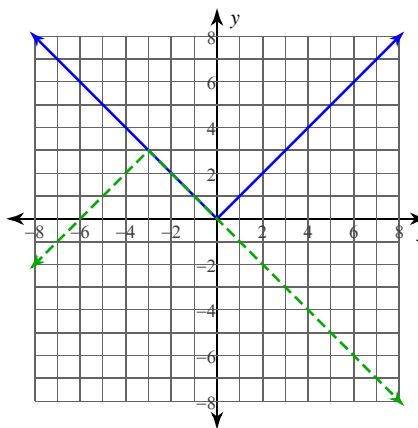
$$g(x) = f\left(\frac{1}{2}x\right) - 1$$

11)



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

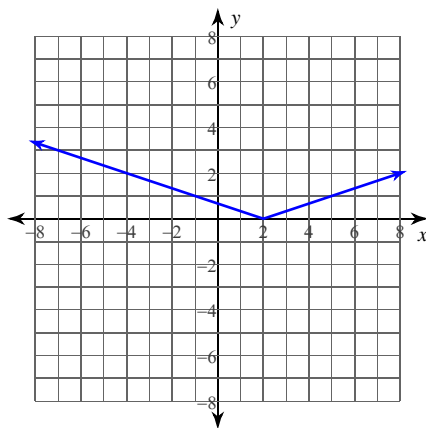
12)



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

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

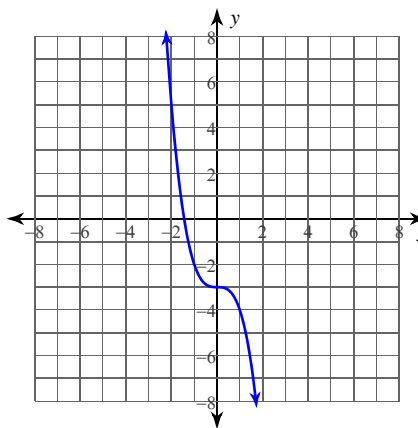
13)



$$\text{Parent: } f(x) = |x|$$

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

14)



$$\text{Parent: } f(x) = x^3$$

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