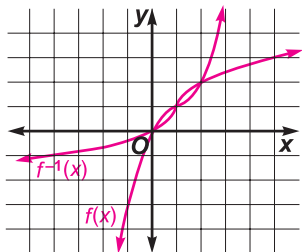


## Practice

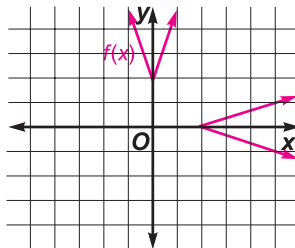
## Inverse Functions and Relations

Graph each function and its inverse.

1.  $f(x) = (x - 1)^3 + 1$



2.  $f(x) = 3|x| + 2$

Find the inverse of  $f(x)$ . Then state whether the inverse is also a function.

3.  $f(x) = -4x^2 + 1$

inverse:

$$y = \pm \frac{1}{2} \sqrt{1 - x}$$

no

4.  $f(x) = \sqrt[3]{x - 1}$

$$f^{-1}(x) = x^3 + 1$$

yes

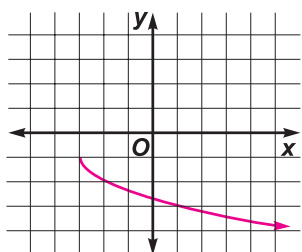
5.  $f(x) = \frac{4}{(x - 3)^2}$

$$\text{inverse: } y = 3 \pm \frac{2\sqrt{x}}{x}$$

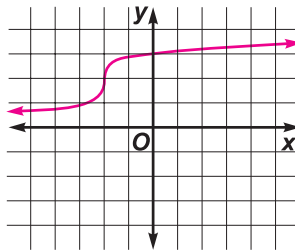
no

Graph each equation using the graph of the given parent function.

6.  $y = -\sqrt{x + 3} - 1, p(x) = x^2$



7.  $y = 2 + \sqrt[5]{x + 2}, p(x) = x^5$



8. **Fire Fighting** Airplanes are often used to drop water on forest fires in an effort to stop the spread of the fire. The time  $t$  it takes the water to travel from height  $h$  to the ground can be derived from the equation  $h = \frac{1}{2}gt^2$  where  $g$  is the acceleration due to gravity (32 feet/second<sup>2</sup>).

- a. Write an equation that will give time as a function of height.

$$t = \sqrt{\frac{h}{16}} \text{ or } \frac{\sqrt{h}}{4}$$

- b. Suppose a plane drops water from a height of 1024 feet. How many seconds will it take for the water to hit the ground?
- 8 seconds**