

## Write each function out and describe the transformation(s)

In Exercises 1–8, describe how the graph of  $y = x^2$  can be transformed to the graph of the given equation.

**1.**  $y = x^2 - 3$

**2.**  $y = x^2 + 5.2$

**3.**  $y = (x + 4)^2$

**4.**  $y = (x - 3)^2$

**5.**  $y = (100 - x)^2$

**6.**  $y = x^2 - 100$

**7.**  $y = (x - 1)^2 + 3$

**8.**  $y = (x + 50)^2 - 279$

In Exercises 9–12, describe how the graph of  $y = \sqrt{x}$  can be transformed to the graph of the given equation.

**9.**  $y = -\sqrt{x}$

**10.**  $y = \sqrt{x - 5}$

**11.**  $y = \sqrt{-x}$

**12.**  $y = \sqrt{3 - x}$

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In Exercises 13–16, describe how the graph of  $y = x^3$  can be transformed to the graph of the given equation.

**13.**  $y = 2x^3$

**14.**  $y = (2x)^3$

**15.**  $y = (0.2x)^3$

**16.**  $y = 0.3x^3$

**Write the functions and describe the transformation(s)  
going from  $f \rightarrow g$**

In Exercises 17–20, describe how to transform the graph of  $f$  into the graph of  $g$ .

**17.**  $f(x) = \sqrt{x + 2}$  and  $g(x) = \sqrt{x - 4}$

**18.**  $f(x) = (x - 1)^2$  and  $g(x) = -(x + 3)^2$

**19.**  $f(x) = (x - 2)^3$  and  $g(x) = -(x + 2)^3$

**20.**  $f(x) = |2x|$  and  $g(x) = 4|x|$