



2. A square-shaped park has an area of  $324 \text{ yd}^2$ . What are the dimensions of the park? Write and solve an equation.

3. A cube has a volume of  $27 \text{ in}^3$ . What is the measure of one of its sides? Write and solve an equation.

## CFU

What positive value of  $x$  makes the following equation true:  $x^2 = 64$ ? Explain.

What positive value of  $x$  makes the following equation true:  $x^3 = 64$ ? Explain.

## GUIDED PRACTICE

Find the positive value of  $x$  that makes the equation true:  $x^2 = 256^{-1}$ .

Is 6 a solution to the equation  $x^2 - 4 = 5x$ ? Explain why or why not.

## CFU

Find the positive value of  $x$  that makes the equation true:  $x^3 = 343^{-1}$ .

### Lesson Summary

The symbol  $\sqrt[n]{\phantom{x}}$  is called a *radical*. An equation that contains that symbol is referred to as a *radical equation*. So far, we have only worked with square roots (i.e.,  $n = 2$ ). Technically, we would denote a positive square root as  $\sqrt[2]{\phantom{x}}$ , but it is understood that the symbol  $\sqrt{\phantom{x}}$  alone represents a positive square root.

When  $n = 3$ , then the symbol  $\sqrt[3]{\phantom{x}}$  is used to denote the cube root of a number. Since  $x^3 = x \cdot x \cdot x$ , the cube root of  $x^3$  is  $x$  (i.e.,  $\sqrt[3]{x^3} = x$ ).

The square or cube root of a positive number exists, and there can be only one positive square root or one cube root of the number.

## INDEPENDENT PRACTICE

1. What positive value of  $x$  makes the following equation true:  $x^2 = 289$ ? Explain.
2. A square-shaped park has an area of  $400 \text{ yd}^2$ . What are the dimensions of the park? Write and solve an equation.
3. A cube has a volume of  $64 \text{ in}^3$ . What is the measure of one of its sides? Write and solve an equation.
4. What positive value of  $x$  makes the following equation true:  $125 = x^3$ ? Explain.
5. Find the positive value of  $x$  that makes the equation true:  $x^2 = 441^{-1}$ .
  - a. Explain the first step in solving this equation.
  - b. Solve and check your solution.

6. Find the positive value of  $x$  that makes the equation true:  $x^3 = 125^{-1}$ .
7. The area of a square is  $196 \text{ in}^2$ . What is the length of one side of the square? Write and solve an equation, and then check your solution.
8. The volume of a cube is  $729 \text{ cm}^3$ . What is the length of one side of the cube? Write and solve an equation, and then check your solution.
9. What positive value of  $x$  would make the following equation true:  $19 + x^2 = 68$ ?