Lesson Summary

The symbol $\sqrt[n]{\ }$ 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 $\sqrt[2]{\ }$, but it is understood that the symbol $\sqrt{\ }$ alone represents a positive square root.

When $n = 3$, then the symbol $\sqrt[3]{\ }$ 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.

Problem Set

Find the positive value of x that makes each equation true. Check your solution.

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: $19 + x^2 = 68$?