

Middle School Math COURSE 3
Chapter 9, Lesson 1, More Examples

Extra Example 1

for use before Example 1

Finding Square Roots

The equation $x^2 = 81$ has two solutions, 9 and -9 . However, the radical expression $\sqrt{81}$ is equal to only 9. Explain why.

Solution

To solve the equation $x^2 = 81$, you find the positive and negative square roots of 81, which are 9 and -9 .

The expression $\sqrt{81}$ represents only the positive square root of 81. The negative square root of 81 is represented as $-\sqrt{81}$. Both the positive and negative square roots can be represented as $\pm\sqrt{81}$.

Extra Example 2

for use before Example 2

Finding a Perfect Square

Tell which two perfect squares the number is between.

- a.** 90 **b.** 33 **c.** 8

Solution

A perfect square is a number that has an integer square root. You can find the perfect squares between 0 and 100 by squaring the numbers 1 through 10. For example, $1^2 = 1$, $2^2 = 4$, $3^2 = 9$, so the numbers 1, 4, and 9 are perfect squares.

- a.** The number 90 is between the perfect squares 81 and 100.
- b.** The number 33 is between the perfect squares 25 and 36.
- c.** The number 8 is between the perfect squares 4 and 9.

Extra Example 3
for use after Example 5

Writing a Square Root Equation

A square has an area of 121 cm^2 . Write and solve an equation to find the side lengths of the square.

Solution

The formula for the area of a square, $A = s^2$, relates the area and the lengths of the sides.

$$A = s^2 \quad \text{Write equation for area.}$$

$$121 = s^2 \quad \text{Substitute 121 for A.}$$

$$\pm \sqrt{121} = s \quad \text{Definition of square root}$$

$$\pm 11 = s \quad \text{Evaluate square roots.}$$

ANSWER The sides of the square are 11 centimeters long. Although solving the equation gave two side lengths, 11 and -11 , it is not possible for the side length of a square to be negative.