

Skill check:

$$8^2 \div (32 \div 2) - 2(3 - 5)$$

7-1 Finding square roots

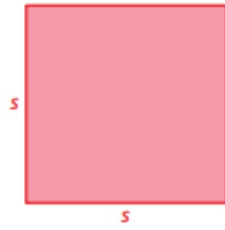
Square root:

is a number that when multiplied by itself equals the given number. Every positive number has a positive and a negative square root.

Perfect square:

Is a number with integers as its square roots.

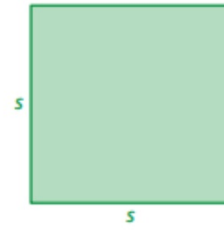
b. Area = 81 yd^2



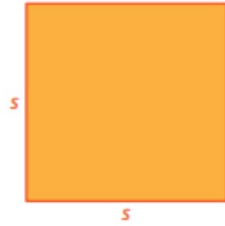
c. Area = 324 cm^2



d. Area = 361 mi^2



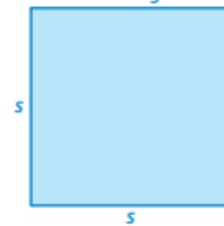
e. Area = 225 mi^2



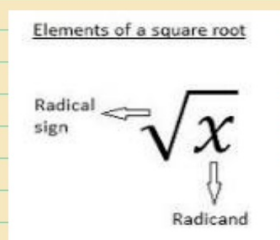
f. Area = 2.89 in.^2



g. Area = $\frac{4}{9} \text{ ft}^2$



The symbol



is called a radical sign. It is used to represent a square root. The number under the radical sign is called the radicand.

Example 1:
Finding square roots
of a perfect square

Find the two square
roots of 49

| Positive Square Root, $\sqrt{}$ | Negative Square Root, $-\sqrt{}$ | Both Square Roots, $\pm\sqrt{}$ |
|--|---|--|
| $\sqrt{16} = 4$ | $-\sqrt{16} = -4$ | $\pm\sqrt{16} = \pm 4$ |

Example 2:
Finding square roots:

a.) Find the square root of 25

b.) Find the square root of

c.) Find the square root of

Practice:
Find the two square roots of the number.

1.) 36

2.) 100

3.) 121



| <u>side</u> | area | area | side |
|---------------|------|---------------------|------|
| $1^2 =$ _____ | | $\sqrt{1} =$ _____ | |
| $2^2 =$ _____ | | $\sqrt{4} =$ _____ | |
| $3^2 =$ _____ | | $\sqrt{9} =$ _____ | |
| $4^2 =$ _____ | | $\sqrt{16} =$ _____ | |
| $5^2 =$ _____ | | $\sqrt{25} =$ _____ | |
| $6^2 =$ _____ | | $\sqrt{36} =$ _____ | |
| $7^2 =$ _____ | | $\sqrt{49} =$ _____ | |
| $8^2 =$ _____ | | $\sqrt{64} =$ _____ | |
| $9^2 =$ _____ | | $\sqrt{81} =$ _____ | |

Example 3: Evaluating expressions involving square roots.

EXAMPLE 3 Evaluating Expressions Involving Square Roots

Evaluate each expression.

a. $5\sqrt{36} + 7 = 5(6) + 7$ Evaluate the square root.

1. Equations of the form $x^2 = p$ where p is a positive number (like $x^2 = 16$) will always have how many real solutions?
2. Equations of the form $x^2 = n$ where n is a negative number (like $x^2 = -12$) will always have how many real solutions?
3. Write an equation of the form $x^2 = r$ where r is a real number that has exactly *one* real solution.
4. Solve the equations below. If the equation has no real solutions, write, "No real solutions."

$$x^2 = 64$$

$$x^2 = 25$$

$$x^2 = 7$$

$$x^2 = 3$$

$$2x^2 = 242$$

$$5x^2 = 125$$

$$x^2 = -100$$

$$3x^2 = 63$$

$$x^2 + 8 = 57$$

$$x^2 + 12 = 1$$

1. Equations of the form $x^2 = p$ where p is a positive number (like $x^2 = 16$) will always have how many real solutions? **2**
2. Equations of the form $x^2 = n$ where n is a negative number (like $x^2 = -12$) will always have how many real solutions? **0**
3. Write an equation of the form $x^2 = r$ where r is a real number that has exactly *one* real solution.
 $x^2 = 0$
4. Solve the equations below. If the equation has no real solutions, write, "No real solutions."

$$x^2 = 64 \quad \mathbf{x = \pm 8}$$

$$x^2 = 25 \quad \mathbf{x = \pm 5}$$

$$x^2 = 7 \quad \mathbf{x = \pm\sqrt{7}}$$

$$x^2 = 3 \quad \mathbf{x = \pm\sqrt{3}}$$

$$2x^2 = 242 \quad \mathbf{x = \pm 11}$$

$$5x^2 = 125 \quad \mathbf{x = \pm 5}$$

$$x^2 = -100 \quad \mathbf{\text{No real solutions.}}$$

$$3x^2 = 63 \quad \mathbf{x = \pm\sqrt{21}}$$

$$x^2 + 8 = 57 \quad \mathbf{x = \pm 7}$$

$$x^2 + 12 = 1 \quad \mathbf{\text{No real solutions.}}$$

$$4x^2 + 1 = 17 \quad \mathbf{x = \pm 2}$$

