

SQUARES AND SQUARE ROOTS

Two students found the area of parallelograms. Use their work at the right to answer a-b.

- a. Which student found the area of a square? Explain.

BRAD

$$\begin{aligned} A &= bh \\ A &= 2.5(6) \\ A &= 15 \text{ cm}^2 \end{aligned}$$

COLLINS

$$\begin{aligned} A &= bh \\ A &= 8(8) \\ A &= 64 \text{ cm}^2 \end{aligned}$$

- b. In what other way could the formula for finding the area of a square be written?

SQUARING A NUMBER

- Squaring a number is the same as multiplying the number by _____ or raising the number to a power of _____. For example, $4^2 = \underline{\hspace{2cm}}$ because $4(4) = \underline{\hspace{2cm}}$.
- Be careful to note negative signs and parentheses when squaring values. Observe the differences below:

$$(-2)^2 = \underline{\hspace{2cm}} \quad -2^2 = \underline{\hspace{2cm}} \quad (-3)^2 = \underline{\hspace{2cm}} \quad -3^2 = \underline{\hspace{2cm}}$$

SQUARE ROOTS

- The square root of a number is the value that multiplied by _____ equals the number.
- While $\sqrt{16}$ is both _____ and _____ (because _____ = 16 and _____ = 16), the _____ square root is known as the principle square root.
- Any number with a square root that is a whole number is called a _____.

Complete a helpful reference of the first 15 perfect squares and square roots by filling out the tables below.

SQUARES:

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2	11^2	12^2	13^2	14^2	15^2

SQUARE ROOTS:

$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$	$\sqrt{\hspace{1cm}}$
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Evaluate the following squares and square roots.

1. $(-7)^2$	2. $(\frac{2}{3})^2$	3. -9^2
4. $-\sqrt{196}$	5. $\sqrt{0.81}$	6. $\sqrt{\frac{9}{16}}$

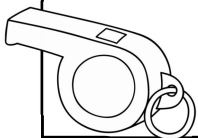
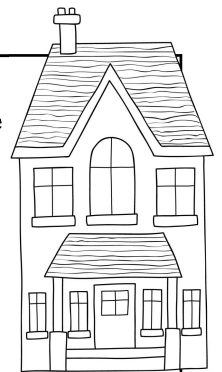
Apply your knowledge of square roots to evaluate each expression.

7. $2\sqrt{64}$	8. $5 + \sqrt{121}$	9. $-3\sqrt{225} + 10$
10. $\sqrt{144} - \sqrt{36}$	11. $15\sqrt{16}$	12. $-\sqrt{81} + 20$

Apply your knowledge of square roots to answer the following questions.

13. A group of 225 students needs to be arranged in a square formation for a halftime performance show. How many students should be lined up in each row?

14. Ivan's room is a square with an area of 144 square feet. What is the perimeter of Ivan's room?



15. Kendall simplified the expression as shown. Explain Kendall's error and correct her work.

$$\begin{array}{r} 5 + \sqrt{100} \\ 5 + 50 \\ 55 \end{array}$$

Summarize today's lesson:

SQUARES AND SQUARE ROOTS

1. Which of the following is a true statement?

- a. A perfect square is a number whose square root is an even number.
- b. The inverse of squaring a number is to divide the number by 2.
- c. To square a number, multiply the number by itself.
- d. All of the above.

2. Which of the following is NOT an example of a perfect square?

- a. 9
- b. 200
- c. 4
- d. 64

3. Which of the following has a value that is less than zero?

- a. $(-6)^2$
- b. $(\frac{1}{3})^2$
- c. 0.5^2
- d. -7^2

4. Explain the difference between $(-5)^2$ and -5^2 .

5.

$$9^2 + 3^2 = \underline{\hspace{2cm}}$$

6.

$$14^2 - \sqrt{144} = \underline{\hspace{2cm}}$$

7.

$$\left(\frac{5}{6}\right)^2 = \underline{\hspace{2cm}}$$

8.

$$3\sqrt{144} = \underline{\hspace{2cm}}$$

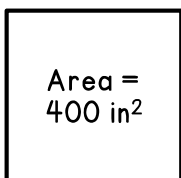
9.

$$5^2 + \sqrt{\frac{49}{64}} = \underline{\hspace{2cm}}$$

10.

$$\sqrt{225} + \sqrt{169} = \underline{\hspace{2cm}}$$

11. Michelle purchased a kid's table with a square top. If the area of the square top is 400 square inches, what is the length of one of the sides?



12. A pyramid has a square base with an area of 169 ft². What is the perimeter of the base of the pyramid?