

LESSON

3

Squares and Square Roots

Review It!

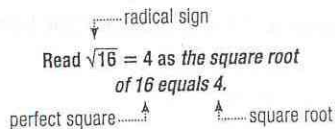
When you work with squares and square roots, remember these words:

**square** the product of a number and itself

**square root** one of two equal factors of a number

**radical sign** symbol for a root

**perfect square** a number whose square root is a whole number



**Example 1** You can find the square root of a perfect square. Find  $\sqrt{49}$ .

**Step 1**  $49 = \underline{\quad} \times \underline{\quad}$ , so  $\sqrt{49} = \underline{\quad}$ . **THINK** 49 is a perfect square.

So, the square root of 49 is  $\underline{\quad}$ .

**Example 2** What is the best whole-number estimate of  $\sqrt{8}$ ?

**Step 1** Find the closest perfect square less than 8. **REMEMBER** A perfect square is the product of a whole number and itself.  
 $4 < 8$

**Step 2** Find the closest perfect square greater than 8.  
 $8 < 9$

**Step 3** Find the perfect square that is closer to 8. **THINK**  $8 - 4 = 4$  and  $9 - 8 = 1$ .  
 $4 < 8 < 9$

$\underline{\quad}$  is closer to 8, so  $\sqrt{9}$  is closer to  $\sqrt{8}$ .

$\sqrt{9} = 3$ , so the best whole-number estimate of  $\sqrt{8}$  is  $\underline{\quad}$ .

Try It!

Find each square root.

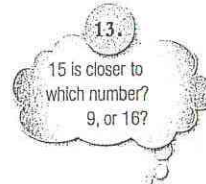
1.  $\sqrt{25} = \underline{\pm 5}$     2.  $\sqrt{100} = \underline{\pm 10}$     3.  $\sqrt{49} = \underline{\pm 7}$   
 4.  $\sqrt{1} = \underline{\pm 1}$     5.  $\sqrt{169} = \underline{\pm 13}$     6.  $\sqrt{4} = \underline{\pm 2}$   
 7.  $\sqrt{64} = \underline{\pm 8}$     8.  $\sqrt{144} = \underline{\pm 12}$     9.  $\sqrt{9} = \underline{\pm 3}$   
 10.  $\sqrt{16} = \underline{\pm 4}$     11.  $\sqrt{36} = \underline{\pm 6}$     12.  $\sqrt{81} = \underline{\pm 9}$

Ask Yourself



What is the BEST whole-number estimate of each square root?

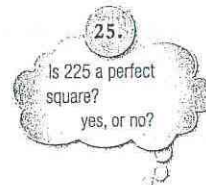
13.  $\sqrt{15} \underline{4}$     14.  $\sqrt{140} \underline{12}$     15.  $\sqrt{80} \underline{9}$   
 16.  $\sqrt{62} \underline{8}$     17.  $\sqrt{30} \underline{5}$     18.  $\sqrt{3} \underline{2}$   
 19.  $\sqrt{75} \underline{9}$     20.  $\sqrt{122} \underline{11}$     21.  $\sqrt{14} \underline{4}$   
 22.  $\sqrt{63} \underline{8}$     23.  $\sqrt{26} \underline{5}$     24.  $\sqrt{46} \underline{7}$



Solve.

25. Nancy wants to make a square garden with an area of 225 square feet. How long should she make each side of the garden?

15 feet



26. Paul made a square patio with an area of 900 square feet. What is the width of the patio?

30 feet

**On Your Own!**

Circle the best answer for each question.

1. What is  $\sqrt{25}$ ?

- A. 5  
 B. 7  
 C. 9.5  
 D. 12.5

2. What is  $\sqrt{81}$ ?

- A. 40.5  
 B. 10  
 C. 9  
 D. 8

3. What is  $\sqrt{100}$ ?

- A. 10,000  
 B. 50  
 C. 25  
 D. 10

4. What is the BEST whole-number estimate of  $\sqrt{50}$ ?

- A. 8  
 B. 7  
 C. 6  
 D. 5

5. What is the BEST whole-number estimate of  $\sqrt{70}$ ?

- A. 35  
 B. 10  
 C. 9  
 D. 8

6. What is the BEST whole-number estimate of  $\sqrt{138}$ ?

- A. 10  
 B. 11  
 C. 12  
 D. 13

7. The area of a square shed is 64 square feet. How wide is the shed?

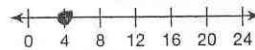
- A. 4 ft  
 B. 8 ft  
 C. 16 ft  
 D. 32 ft

8. The area of a square playground is 1,600 square feet. How wide is the playground?

- A. 40 ft  
 B. 80 ft  
 C. 400 ft  
 D. 800 ft

9. What is  $\sqrt{25}$ ?

$$\underline{\underline{+25}}$$

10. Plot a point at  $\sqrt{16}$  on the number line below.**Math Words**

Fill in the blanks.

11. A square root shows a number under a radical symbol.
12. The numbers 1, 4, 9, 16, 25, are examples of perfect squares.
13. The opposite of squaring a number is taking the square root.