Vocabulary

Review

1. Circle the numbers that are *perfect squares*.

1	12	16	20
100	121	200	289

Vocabulary Builder

square root (noun) **skwer root**

Definition: The **square root** of a number is a number that when multiplied by itself is equal to the given number.

Using Symbols: $\sqrt{16} = 4$

Using Words: The **square root** of 16 is 4. It means, "I multiply 4 by itself to get 16."

square root
$\downarrow$
$\sqrt{16} = 4$
because
$4^2 = 16$

Use Your Vocabulary

2. Use what you know about *perfect squares* and *square roots* to complete the table.

Number	Number Squared
1	1
2	4
3	
4	
5	
	36

Number	Number Squared
7	49
	64
	81
11	

Problem 1 Simplifying Square Root Expressions

Got It? What is the simplified form of $\sqrt{64}$?

3. Circle the equation that uses the positive square root of 64.

| $16 \cdot 4 = 64$ | $32 \cdot 2 = 64$ | $8 \cdot 8 = 64$ |

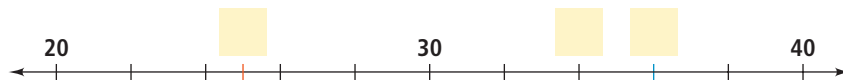**4.** The simplified form of $\sqrt{64}$ is ☐.
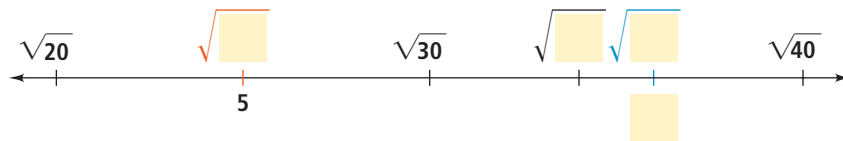
Problem 2 Estimating a Square Root

Got It? What is the value of $\sqrt{34}$ to the nearest integer?

5. Use the number lines below to find the perfect squares closest to 34.

Write 25, 34, and 36 in the correct positions on the number line.

Complete the number line with square roots.

6. Since 34 is closer to ☐ than to ☐,

$\sqrt{34}$ is closer to ☐ than to ☐.

So, the value of $\sqrt{34}$ to the nearest integer is ☐.

You can classify numbers using *sets*. A **set** is a well-defined collection of objects. Each object in the set is called an **element** of the set. A **subset** of a set consists of elements from the given set. You can list the elements of a set within braces { }.

7. Complete the *sets* of numbers.

Natural numbers

$$\left\{ 1, \boxed{}, 3, \ldots \right\}$$

Whole numbers

$$\left\{ \boxed{}, 1, \boxed{}, 3, \ldots \right\}$$

Integers

$$\left\{ \ldots, -2, \boxed{}, 0, 1, \boxed{}, 3, \ldots \right\}$$

A **rational number** is any number that you can write in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$. A rational number in decimal form is either a terminating decimal such as 5.45 or a repeating decimal such as 0.333..., which you can write as $0.\overline{3}$.

8. Cross out the numbers that are NOT *rational numbers*.

| π | $-\dfrac{7}{4}$ | $\sqrt{5}$ | $0.\overline{9}$ | 7.35 |

An **irrational number** cannot be represented as the quotient of two integers. In decimal form, irrational numbers do not terminate or repeat. Irrational numbers include π and $\sqrt{2}$.

11

Got It? To which subsets of the real numbers does each number belong?

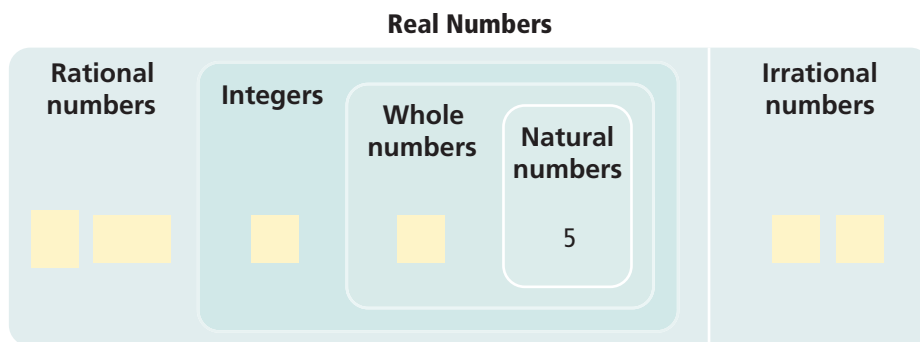$\sqrt{9}$ $\frac{3}{10}$ -0.45 $\sqrt{12}$

9. Is each number an element of the set? Place a ✔ if it is. Place an ✗ if it is not.

Number	Whole Numbers	Integers	Rational Numbers	Irrational Numbers
$\sqrt{9}$	✔	✔	✔	✗
$\frac{3}{10}$				
-0.45				
$\sqrt{12}$				

take note

Concept Summary **Real Numbers**

10. Write each of the numbers -7, -5.43, 0, $\frac{3}{7}$, π, and $\sqrt{7}$ in a box below. The number 5 has been placed for you.

Real Numbers

Rational numbers

Integers

Whole numbers

Natural numbers

5

Irrational numbers

✓ **Problem 4** **Comparing Real Numbers**

Got It? What is an inequality that compares the numbers $\sqrt{129}$ and 11.52?

11. What is the approximate value of $\sqrt{129}$ to the nearest hundredth?

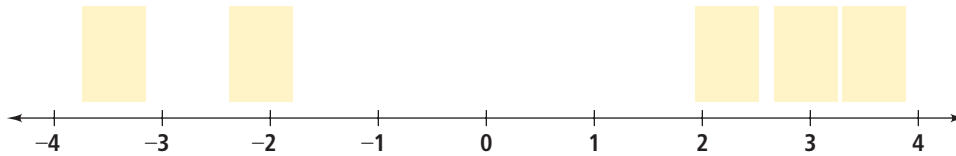**12.** Use $<$, $>$, or $=$ to complete the statement.

$\sqrt{129}$ ☐ 11.52

Got It? Graph 3.5, -2.1, $\sqrt{9}$, $-\frac{7}{2}$, and $\sqrt{5}$ on a number line. What is the order of the numbers from least to greatest?

13. Simplify the radicals and convert the fraction to a mixed number.

$\sqrt{9} = $ [   ] $-\frac{7}{2} = $ [   ] $\sqrt{5} \approx$ [   ]

14. Now use the number line to graph the five original numbers. Be sure to label each point with the correct number.

15. Now list the five original numbers from *least* to *greatest*.

[   ] , [   ] , [   ] , [   ] , [   ]

Lesson Check • **Do you UNDERSTAND?**

Reasoning Tell whether $\sqrt{100}$ and $\sqrt{0.29}$ are *rational* or *irrational*. Explain.

16. First try to simplify the expression. If it does not simplify, put an ✗ in the box.

$\sqrt{100} = $ [   ] $\sqrt{0.29} = $ [   ]

17. Tell whether each square root is *rational* or *irrational*. Explain your reasoning.

_____

_____

_____

_____

Math Success

Check off the vocabulary words that you understand.

☐ square root   ☐ rational numbers   ☐ irrational numbers   ☐ real numbers

Rate how well you can *classify and order real numbers*.

Need to review   0   2   4   6   8   10   Now I get it!