1-2 Skills Practice
Properties of Real Numbers

Name the sets of numbers to which each number belongs.

1. 34   **N, W, Z, Q, R**

2. -525 **Z, Q, R**

3. 0.875 **Q, R**

4. $\dfrac{12}{3}$ **N, W, Z, Q, R**

5. $-\sqrt{9}$ **Z, Q, R**

6. $\sqrt{30}$ **I, R**

Name the property illustrated by each equation.

7. $3 \cdot x = x \cdot 3$
   Comm. (×)

8. $3a + 0 = 3a$
   Add. Iden.

9. $2(r + w) = 2r + 2w$
   Distributive

10. $2r + (3r + 4r) = (2r + 3r) + 4r$
   Assoc. (+)

11. $5y\left(\dfrac{1}{5y}\right) = 1$
   Mult. Inv.

12. $15x(1) = 15x$
   Mult. Iden.

13. $0.6[25(0.5)] = [0.6(25)]0.5$
   Assoc. (×)

14. $(10b + 12b) + 7b = (12b + 10b) + 7b$
   Comm. (+)

Find the additive inverse and multiplicative inverse for each number.

15. 15   **$-15, \dfrac{1}{15}$**

16. 1.25 **$-1.25, 0.8$**

17. $-\dfrac{4}{5}$ **$\dfrac{4}{5}, -\dfrac{5}{4}$**

18. $3\dfrac{3}{4}$ **$-3\dfrac{3}{4}, \dfrac{4}{15}$**

Simplify each expression.

19. $3x + 5y + 2x - 3y$ **5x + 2y**

20. $x - y - z + y - x + z$ **0**

21. $-(3g + 3h) + 5g - 10h$ **2g − 13h**

22. $a^2 - a + 4a - 3a^2 + 1$ **−2a² + 3a + 1**

23. $3(m - z) + 5(2m - z)$ **13m − 8z**

24. $2x - 3y - (5x - 3y - 2z)$ **−3x + 2z**

25. $6(2w + v) - 4(2v + 1w)$ **8w − 2v**

26. $\dfrac{1}{3}(15d + 3c) - \dfrac{1}{2}(8c - 10d)$ **10d − 3c**
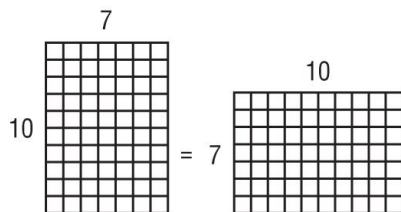
1-2 Word Problem Practice
Properties of Real Numbers

1. MENTAL MATH There are more than 3 million elementary teachers in the U.S. When teaching their students to multiply and learn place value, teachers often show that $54 \times 8 = (50 + 4) \times 8 = (50 \times 8) + (4 \times 8)$. What property is used?
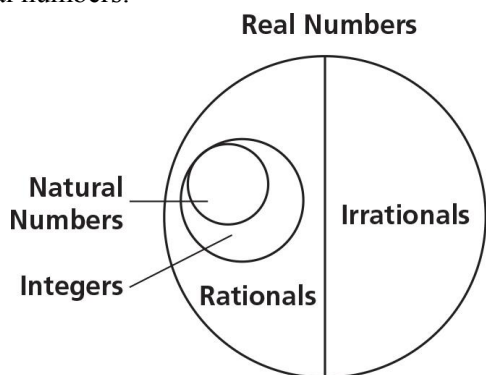**Distributive Property**

2. MODELS What property of real numbers is illustrated by the figure below?

Commutative Property of Multiplication

3. VENN DIAGRAMS Make a Venn diagram that shows the relationship between natural numbers, integers, rational numbers, irrational numbers, and real numbers.

4. NUMBER THEORY Consider the following two statements.
 I. The product of any two rational numbers is always another rational number.
 II. The product of two irrational numbers is always irrational. Determine if these statements are always, sometimes, or never true. Explain.

I. always II. sometimes,
$\sqrt{2} \cdot \sqrt{2} = 2$

5. RIGHT TRIANGLES The lengths of the sides of the right triangle shown are related by the formula $c^2 = a^2 + b^2$.
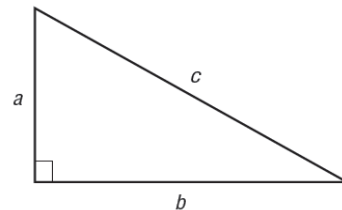
For each set of values for a and b, determine the value of c. State whether c is a natural number.

a. $a = 5, b = 12$
 $c = 13$; it is a natural number.

b. $a = 7, b = 14$
 $c = \sqrt{245}$ or $7\sqrt{5}$; it is not a natural number.

c. $a = 7, b = 24$
 $c = 25$; it is a natural number.