

# Lesson 1.1 Number Properties

There are certain rules or properties of math that are always true.

The **Commutative Properties** of addition and multiplication state that the order in which numbers are added or multiplied does not change the result.

$$\begin{array}{ll} a + b = b + a & \text{and} \quad a \times b = b \times a \\ 2 + 3 = 5 & 5 \times 2 = 10 \\ 3 + 2 = 5 & 2 \times 5 = 10 \end{array}$$

The **Associative Properties** of addition and multiplication state that the way in which addends or factors are grouped does not change the result.

$$\begin{array}{ll} (a + b) + c = a + (b + c) & \text{and} \quad (a \times b) \times c = a \times (b \times c) \\ (2 + 3) + 4 = 2 + (3 + 4) & (2 \times 4) \times 5 = 2 \times (4 \times 5) \\ 5 + 4 = 2 + 7 & 8 \times 5 = 2 \times 20 \\ 9 = 9 & 40 = 40 \end{array}$$

The **Identity Property of Addition** states that the sum of an addend and 0 is the addend.  
 $5 + 0 = 5$

The **Identity Property of Multiplication** states that the product of a factor and 1 is that factor.  
 $4 \times 1 = 4$

The **Properties of Zero** state that the product of a factor and 0 is 0.  $5 \times 0 = 0$

The properties of zero also state that the quotient of zero and any non-zero divisor is 0.  $0 \div 5 = 0$

Name the property shown by each statement.

a

1.  $2 \times 8 = 8 \times 2$  \_\_\_\_\_

2.  $35 \times 1 = 35$  \_\_\_\_\_

3.  $4 \times (6 \times 2) = (4 \times 6) \times 2$  \_\_\_\_\_

4.  $45 + 0 = 45$  \_\_\_\_\_

b

$2 + (3 + 4) = (2 + 3) + 4$  \_\_\_\_\_

$32 + 25 = 25 + 32$  \_\_\_\_\_

$0 \times 9 = 0$  \_\_\_\_\_

$18 \times 0 = 0 \times 18$  \_\_\_\_\_

Rewrite each expression using the property indicated.

5. Associative;  $(3 + 5) + 2 =$  \_\_\_\_\_

Commutative;  $5 \times 7 =$  \_\_\_\_\_

6. Identity;  $0 + 4 =$  \_\_\_\_\_

Associative;  $3 \times (2 \times 5) =$  \_\_\_\_\_

7. Commutative;  $7 + 9 =$  \_\_\_\_\_

Associative;  $(2 + 5) + 4 =$  \_\_\_\_\_

8. Identity;  $7 \times 1 =$  \_\_\_\_\_

Identity;  $37 + 0 =$  \_\_\_\_\_

9. Properties of Zero;  $0 \times 12 =$  \_\_\_\_\_

Properties of Zero;  $0 \div 6 =$  \_\_\_\_\_