

**LESSON** **Reading Strategies**

**2-1** **Focus on Vocabulary**

The Commutative, Associative, and Distributive Properties of mathematics can make it easier to use mental math.

**Commutative Property**—The word **commute** means **to exchange**. In mathematics, when **addends or factors exchange places**, the sum or product is not affected.

**Addends change places**

$$\begin{array}{c}
 13 + 18 + 17 \\
 \swarrow \quad \searrow \\
 13 + 17 + 18 \\
 30 + 18 = 48
 \end{array}$$

**Factors change places**

$$\begin{array}{c}
 4 \times 7 \times 5 \\
 \swarrow \quad \searrow \\
 4 \times 5 \times 7 \\
 20 \times 7 = 140
 \end{array}$$

**Associative Property**—The word **associate** means **to join**. In mathematics, when **addends or factors are joined, or grouped, with parentheses** in different ways, the sum or product is not affected.

**Addends are grouped**

$$\begin{array}{c}
 11 + 4 + 16 \\
 \downarrow \\
 11 + (4 + 16) \\
 11 + 20 = 31
 \end{array}$$

**Factors are grouped**

$$\begin{array}{c}
 7 \times 8 \times 5 \\
 \downarrow \\
 7 \times (8 \times 5) \\
 7 \times 40 = 280
 \end{array}$$

**Distributive Property**—The word **distribute** means **to give out**. In mathematics, you can **distribute a factor** over a sum without affecting the original product.

$$\begin{array}{c}
 5 \times 17 \\
 \swarrow \quad \searrow \\
 (5 \times 10) + (5 \times 7) \\
 50 + 35 \\
 85
 \end{array}$$

$$17 = 10 + 7$$

Distribute 5 as a factor.  
 Multiply.  
 Add.

**Answer each question.**

1. Rewrite  $17 + 8 + 13$  using the Commutative Property, then compute.

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2. Rewrite  $9 \times 8 \times 5$  using the Associative Property, then compute.

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3. Rewrite  $7 \times 28$  using the Distributive Property, then compute.

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**LESSON**  
**2-1**

**Practice A**

**Properties and Mental Math**

Choose the letter of the equation that shows the given property.

1. Associative Property

A  $2 + 3 = 3 + 2$

B  $7 \times 8 = 7 \times (4 + 4)$

C  $8 \times (6 \times 5) = (8 \times 6) \times 5$

D  $9 \times (2 + 4) = (9 \times 2) + (9 \times 4)$

2. Distributive Property

F  $3 \times (6 \times 11) = (3 \times 6) \times 11$

G  $75 + 15 = 15 + 75$

H  $9 \times 8 = 8 \times 9$

I  $12 \times (4 + 7) = (12 \times 4) + (12 \times 7)$

3. Commutative Property

A  $3 \times (7 + 8) = 3 \times 15$

B  $(10 + 4) + 3 = 10 + (4 + 3)$

C  $(9 + 2) \times 5 = (9 \times 5) + (2 \times 5)$

D  $6 \times 5 = 5 \times 6$

4. Associative Property

F  $20 \times (3 + 3) = (20 \times 3) + (20 \times 3)$

G  $4 + (3 + 9) = (4 + 3) + 9$

H  $(10 + 5) \times 7 = 15 \times 7$

I  $16 \times 8 = 8 \times 16$

Rewrite each expression using the named property.

5.  $8 + 12$ ; Commutative Property

6.  $(9 \times 6) \times 4$ ; Associative Property

7.  $3 \times (5 + 2)$ ; Distributive Property

8.  $2 \times (4 + 5)$ ; Distributive Property

Find each sum or product.

9.  $7 + 15 + 3 + 5$

10.  $7 \times 2 \times 5$

11.  $4 \times 3 \times 5$

Multiply using the Distributive Property.

12.  $4 \times 38$

13.  $6 \times 53$

14.  $8 \times 42$

15. Sue has \$4, Tom has \$11, Brian has \$6, and Anita has \$9. Use mental math to find how much money they have altogether.

16. Each minibus seats 14 people, and the school owns 5 minibuses. Use mental math to find how many students can ride in the school's minibuses at the same time.