

**LESSON**

**Student Worksheet**

**2-1 Properties and Mental Math**

**Problem 1**

I need to rearrange this equation, so I can add it in my head.

$$12 + 4 + 18 + 46$$

$$12 + 18 + 4 + 46$$

$$(12 + 18) + (4 + 46)$$

$$12 + 18 = 30$$

$$4 + 46 = 50$$

$$30 + 50$$

$$30 + 50 = 80$$

$$80$$

**LOOK!**

Look for sums of 10.

**Problem 2**

$$4 \times 23$$

$$4 \times (20 + 3)$$

$$(4 \times 20) + (4 \times 3)$$

$$80 + 12$$

$$92$$

Multiply 4 by each number.

It would be easier to multiply by a multiple of 10.

23 is the same as 20 + 3.

**Think and Discuss**

1. In Problem 1, why did you group 12 and 18 together?

\_\_\_\_\_

2. Does it matter which number you add first in Problem 1? \_\_\_\_\_

3. In Problem 2, is it easier to multiply  $23 \times 4$  or  $20 \times 4$ ? \_\_\_\_\_

4. Which properties did you use in Problem 1? \_\_\_\_\_

**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.

**LESSON**

**Review for Mastery**

**2-1**

**Properties and Mental Math**

**Commutative Property**

Changing the order of addends does not change the sum.

$$21 + 13 = 13 + 21$$

Changing the order of factors does not change the product.

$$5 \times 7 = 7 \times 5$$

**Associative Property**

Changing the grouping of addends does not change the sum.

$$(3 + 8) + 4 = 3 + (8 + 4)$$

Changing the grouping of factors does not change the product.

$$2 \times (7 \times 4) = (2 \times 7) \times 4$$

**Distributive Property**

When you multiply a number by a sum, you can

- Find the sum and then multiply.  $3 \times (8 + 4) = 3 \times 12 = 36$

or

- Multiply the number by each addend and then find the sum.

$$3 \times (8 + 4) = (3 \times 8) + (3 \times 4) = 24 + 12 = 36$$

**Identify the property shown.**

1.  $3 \times (2 \times 6) = (3 \times 2) \times 6$

2.  $7 + 18 = 18 + 7$

3.  $4 \times (8 + 5) = (4 \times 8) + (4 \times 5)$

4.  $11 \times 8 = 8 \times 11$

5.  $3 \times (8 + 4) = (3 \times 8) + (3 \times 4)$

6.  $(3 + 8) + 4 = 3 + (8 + 4)$

**Identify the property shown and the missing number in each equation.**

7.  $9 + 16 = y + 9$

8.  $4 \times (3 \times 2) = (4 \times n) \times 2$

9.  $3 \times (11 + 4) = (3 \times a) + (3 \times 4)$

10.  $6 \times (9 + 14) = (b \times 9) + (b \times 14)$

**LESSON**

**Review for Mastery**

**2-1**

**Properties and Mental Math (continued)**

**Find each sum or product.**

A.  $8 + 9 + 22 + 31$

$8 + 22 + 9 + 31$  Use the Commutative Property.

$(8 + 22) + (9 + 31)$  Use the Associative Property.

$30 + 40$  Use mental math to add.

70

B.  $5 \times 7 \times 4$

$7 \times 5 \times 4$  Use the Commutative Property.

$7 \times (5 \times 4)$  Use the Associative Property.

$7 \times 20$  Use mental math to multiply.

140

**Find each sum or product.**

11.  $3 + 58 + 27 + 22$

12.  $8 \times 3 \times 5$

13.  $5 \times 3 \times 4$

14.  $54 + 32 + 78 + 106$

15.  $84 + 11 + 26 + 39$

16.  $10 \times 3 \times 7$

**Find the product.**

$6 \times 34$

**Step 1:** Write one factor as a sum of two numbers.

$6 \times 34 = 6 \times (30 + 4)$

**Step 2:** Use the Distributive Property.

$6 \times (30 + 4) = (6 \times 30) + (6 \times 4)$

**Step 3:** Use mental math to multiply and add.

$(6 \times 30) + (6 \times 4) = 180 + 24 = 204$

**Use the Distributive Property to find each product.**

17.  $6 \times 43$

18.  $12 \times 34$

19.  $53 \times 4$

20.  $74 \times 8$