NAME _____ DATE _____ PERIOD _____

1-6 Study Guide and Intervention

Commutative and Associative Properties

Commutative and Associative Properties The Commutative and Associative Properties can be used to simplify expressions. The Commutative Properties state that the order in which you add or multiply numbers does not change their sum or product. The Associative Properties state that the way you group three or more numbers when adding or multiplying does not change their sum or product.

Commutative Properties	For any numbers a and b, $a + b = b + a$ and $a \cdot b = b \cdot a$.
Associative Properties	For any numbers a, b, and c, $(a + b) + c = a + (b + c)$ and $(ab)c = a(bc)$.

Example 1 **Evaluate $6 \cdot 2 \cdot 3 \cdot 5$.**

$6 \cdot 2 \cdot 3 \cdot 5 = 6 \cdot 3 \cdot 2 \cdot 5$ Commutative Property
$= (6 \cdot 3)(2 \cdot 5)$ Associative Property
$= 18 \cdot 10$ Multiply.
$= 180$ Multiply.

The product is 180.

Example 2 **Evaluate $8.2 + 2.5 + 2.5 + 1.8$.**

$8.2 + 2.5 + 2.5 + 1.8$
$= 8.2 + 1.8 + 2.5 + 2.5$ Commutative Prop.
$= (8.2 + 1.8) + (2.5 + 2.5)$ Associative Prop.
$= 10 + 5$ Add.
$= 15$ Add.

The sum is 15.

Exercises

Evaluate each expression.

1. $12 + 10 + 8 + 5$

2. $16 + 8 + 22 + 12$

3. $10 \cdot 7 \cdot 2.5$

4. $4 \cdot 8 \cdot 5 \cdot 3$

5. $12 + 20 + 10 + 5$

6. $26 + 8 + 4 + 22$

7. $3\frac{1}{2} + 4 + 2\frac{1}{2} + 3$

8. $\frac{3}{4} \cdot 12 \cdot 4 \cdot 2$

9. $3.5 + 2.4 + 3.6 + 4.2$

10. $4\frac{1}{2} + 5 + \frac{1}{2} + 3$

11. $0.5 \cdot 2.8 \cdot 4$

12. $2.5 + 2.4 + 2.5 + 3.6$

13. $\frac{4}{5} \cdot 18 \cdot 25 \cdot \frac{2}{9}$

14. $32 \cdot \frac{1}{5} \cdot \frac{1}{2} \cdot 10$

15. $\frac{1}{4} \cdot 7 \cdot 16 \cdot \frac{1}{7}$

16. $3.5 + 8 + 2.5 + 2$

17. $18 \cdot 8 \cdot \frac{1}{2} \cdot \frac{1}{9}$

18. $\frac{3}{4} \cdot 10 \cdot 16 \cdot \frac{1}{2}$