

<b>Chapter 3</b>	<b>Algebraic Expressions and Properties</b>
Date: _____	<b>3.3 Properties of Addition and Multiplication</b>
<b>Essential Question</b>	<b>Does the order in which you perform an operation matter?</b>

## Vocab

Vocab	Definition	Examples
equivalent expression	2 or more expressions that have the same value	$5 + 6 = 3 + 8$ or $3 \times 10 = 6 \times 5$
commutative property of addition	changing the <u>order</u> of addends does not change the sum	$12 + 7$ and $7 + 12$ have the same sum
commutative property of multiplication	changing the <u>order</u> of factors does not change the product	$4 \times 5$ and $5 \times 4$ have the same product
associative property of addition	changing the <u>grouping</u> of addends does not change the sum	$(7 + 4) + 2 = 7 + (4 + 2)$
associative property of multiplication	changing the <u>grouping</u> of factors does not change the products	$(3 \times 5) \times 2 = 3 \times (5 \times 2)$

Complete numbers 1 - 3 in your composition book.

**Simplify each expression. Tell what property you used.**

1)  $7 + (12 + x)$

$(7 + 12) + x$       **associative property of addition**

$19 + x$

---

2)  $(6.1 + x) + 8.4$

$(x + 6.1) + 8.4$       **commutative property of addition**

$x + (6.1 + 8.4)$       **associative property of addition**

$x + 14.5$

---

3)  $5(11y)$

$(5 \cdot 11)y$       **associative property of multiplication**

$55y$

---

Complete numbers 1 and 2 on your notes page.

**Simplify each expression. Tell what property you used.**

1)  $(9 + a) + 10$

$(a + 9) + 10$  commutative property of addition

$a + (9 + 10)$  associative property of addition

$a + 19$

2)  $(4n)5$

$5(4n)$  commutative property of multiplication

$(5 \cdot 4)n$  associative property of multiplication

$20n$

## Vocab

Vocab	Definition	Examples
Addition Property of Zero	the sum of any number and 0 is that number	$7 + 0 = 7$ or $a + 0 = a$
multiplication property of zero	the product of any number and 0 is 0	$9 \cdot 0 = 0$ $b \cdot 0 = 0$
multiplication property of one	the product of any number and 1 is that number	$4 \cdot 1 = 4$ $h \cdot 1 = h$

Complete numbers 4-6 in your composition book.

Simplify each expression. Explain each step.

4)  $9 \cdot 0 \cdot p$

$0$       **Multiplication Property of Zero**

5)  $4.5 \cdot r \cdot 1$

$(4.5 \cdot r) \cdot 1$       **Associative Property of Multiplication**

$4.5r \cdot 1$       **Multiplication Property of One**

$4.5r$

6)  $\frac{3}{4} + 0$

$\frac{3}{4}$       **Addition Property of Zero**

Complete numbers 3 and 4 on your notes page.

Simplify each expression. Explain each step.

3)  $1 \cdot m \cdot 24$

$1 \cdot (m \cdot 24)$  Associative Property of Multiplication

$1 \cdot 24m$  Commutative Property of Multiplication

$24m$  Multiplication Property of One

4)  $12 \cdot b \cdot 0$

$(12 \cdot b) \cdot 0$  Associative Property of Multiplication

$12b \cdot 0$  Multiplication Property of Zero

$0$

**Complete number 7 in your composition book.**

- 7) You and six friends play on a basketball team. A sponsor paid \$100 for the league fee,  $x$  dollars for each player's shirt, and \$68.25 for trophies. Write an expression for the total amount paid by the sponsor. Then simplify the expression and explain each step.

$$100 + 7x + 68.25$$

$$7x + 100 + 68.25$$

**Commutative Property of  
Addition**

$$7x + 168.25$$



Complete number 5 on your notes page.

5)

The length of one side of a square is  $3x$ . Write an expression to find the perimeter of the square. Then simplify the expression and explain each step.

$$4(3x)$$

$$(4 \cdot 3) \cdot x$$

**Associative Property of  
Multiplication**

$$12x$$