3.3

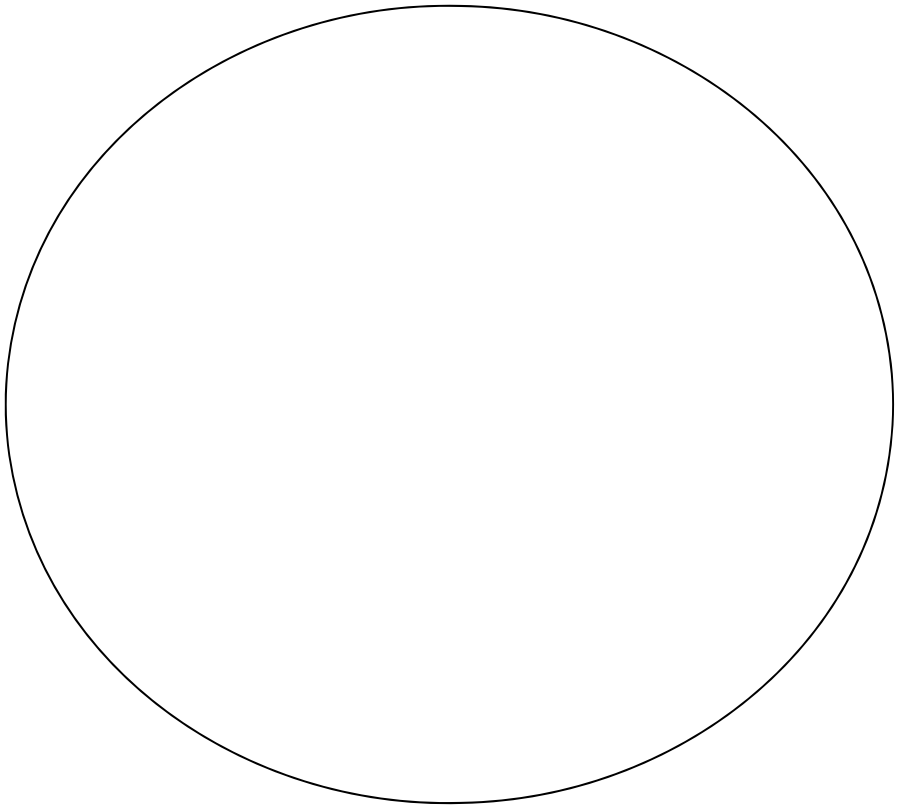
Properties of Addition & Multiplication

Activity – Does Order Matter?

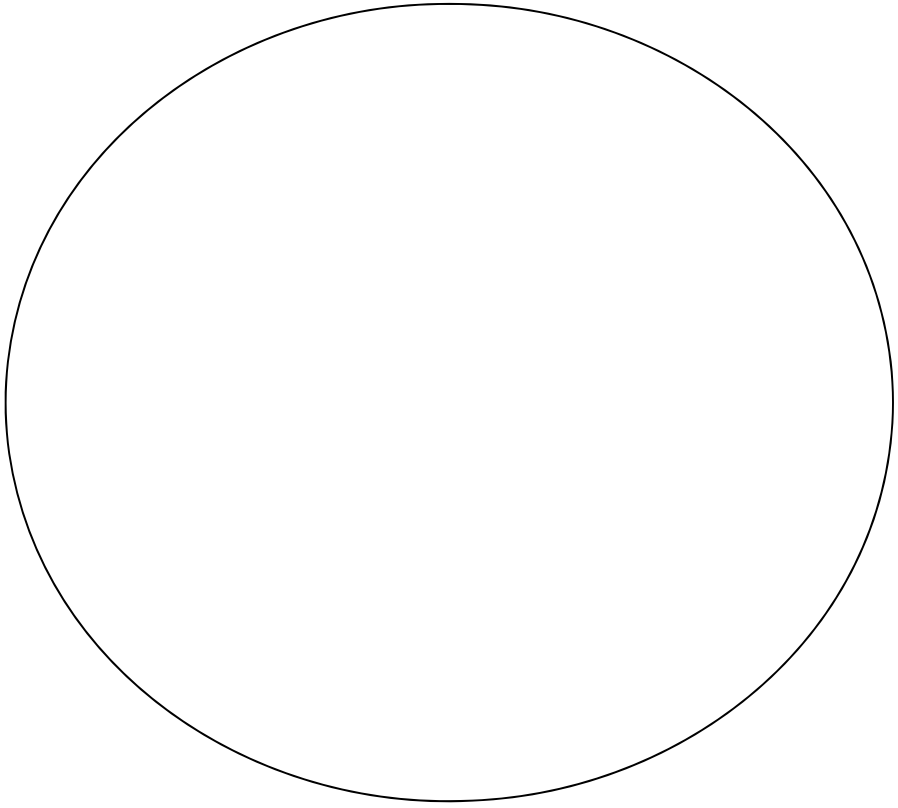
Work with a partner. Place each statement in the correct oval.

a. Fasten 5 shirt buttons.
b. Put on a shirt and tie.
c. Fill and seal an envelope.
d. Floss your teeth.
e. Put on your shoes.
f. Chew and swallow.

Order Matters



Order Doesn't Matter



Activity – Commutative Properties

Work with a partner.

a. Circle the statements that are true.

$$3 + 5 \stackrel{?}{=} 5 + 3 \qquad 9 \times 3 \stackrel{?}{=} 3 \times 9$$

$$3 - 5 \stackrel{?}{=} 5 - 3 \qquad 9 \div 3 \stackrel{?}{=} 3 \div 9$$

b. The true equations show the Commutative Properties of Addition and Multiplication. Why do you think they are called *commutative*?

Activity – Associative Properties

Work with a partner.

a. Circle the statements that are true.

$$8 + (3 + 1) \stackrel{?}{=} (8 + 3) + 1$$

$$8 - (3 - 1) \stackrel{?}{=} (8 - 3) - 1$$

$$12 \times (6 \times 2) \stackrel{?}{=} (12 \times 6) \times 2$$

$$12 \div (6 \div 2) \stackrel{?}{=} (12 \div 6) \div 2$$

b. The true equations show the Associative Properties of Addition and Multiplication. Why do you think they are called *associative*?

THE COMMUTATIVE PROPERTY

"Commute" - _____

That property means that we _____ _____ terms and that the _____ _____ _____ _____.

$$7 + 8 = 8 + 7$$

$$3 \times 4 = 4 \times 3$$

$$a + b = b + a$$

$$12 \times a = a \times 12$$

The commutative property only works for addition and multiplication.

THE ASSOCIATIVE PROPERTY

"Associate" - _____

That property means that the _____ of terms does not _____ ___ _____ .

$$(7+8)+2 = 7+(8+2)$$

$$(a+b)+c = a+(b+c)$$

$$(3 \times 4) \times 2 = 3 \times (4 \times 2)$$

$$(a \times b) \times c = a \times (b \times c)$$

The associative property only works for addition and multiplication.

DO YOU UNDERSTAND?

Identify the property being used.

1) $(7+4)+2=7+(4+2)$

2) $8 \bullet 5 = 5 \bullet 8$

3) $9+4=4+9$

4) $3 \times (9 \times 2) = (3 \times 9) \times 2$

DO YOU UNDERSTAND?

Identify the property being used.

5) $(15a)b = 15(ab)$

6) $x + (7 + 9) = x + (9 + 7)$

Using Properties to Write Equivalent Expressions

Simplify the expression. Explain each step.

1) $5 + x + 9$

_____

_____

2) $7 + (12 + x)$

_____

_____

Using Properties to Write Equivalent Expressions

Simplify the expression. Explain each step.

3) $(6.1 + x) + 8.4$

4) $5(11y)$

Addition Property of Zero

The _____ of any _____ and _____ is that number.

$$7 + 0 = 7$$

$$0 + 8 = 8$$

$$a + 0 = a$$

Multiplication Property of Zero

The _____ of any _____ and _____ is _____ .

$$7 \times 0 = 0$$

$$0 + 9 = 0$$

$$a \times 0 = 0$$

Multiplication Property of One

The _____ of any _____ and _____ is that number.

$$4 \times 1 = 4$$

$$1 \times 13 = 13$$

$$a \times 1 = a$$

Using Properties to Write Equivalent Expressions

Simplify the expression. Explain each step.

1) $9 \cdot 0 \cdot p$

_____

_____

2) $4.5 \cdot r \cdot 1$

_____

_____

Using Properties to Write Equivalent Expressions

Simplify the expression. Explain each step.

3) $12 \cdot b \cdot 0$

4) $(t + 15) + 0$

Real-Life Application

You and six friends play on a basketball team. A sponsor paid $100 for the league fee, x dollars for each player's T-shirt, and $68.25 for trophies. Write an expression for the total amount the sponsor paid.

Add the league fee, the cost of the T-shirts, and the cost of the trophies.