

**1 - 4**

# **Identity and Equality Properties**

## additive identity:

For any #  $a$ ,  $a + 0 = a$ .

$$7 + 0 = 7$$

$$0 + 4 = 4$$

## multiplicative identity:

For any #  $a$ ,  $a \cdot 1 = a$ .

$$4 \cdot 1 = 4$$

$$1 \cdot \frac{1}{2} = \frac{1}{2}$$

## multiplicative property of zero:

For any  $\neq a$ ,  $a \cdot 0 = 0$ .

$$5 \cdot 0 = 0$$

$$0 \cdot \frac{3}{4} = 0$$

## multiplicative inverse:

For any  $\neq \frac{a}{b}$  ( $a, b \neq 0$ )

there exists a  $\neq \frac{b}{a}$  so that

$$\frac{a}{b} \cdot \frac{b}{a} = 1.$$

$$\text{ex: } \frac{2}{3} \cdot \frac{3}{2} = 1$$

$$\text{ex: } \frac{4}{1} \cdot \frac{1}{4} = 1$$

reflexive:  $a = a$

$$\frac{2}{3} = \frac{2}{3}$$

$$1.064 = 1.064$$

symmetric: If  $a=b$ , then  $b=a$ .

$$10 = x + 2$$

$$x + 2 = 10$$

**transitive:**

If  $a=b$  and  $b=c$ , then  $a=c$ .



## substitution:

If  $a=b$ , then  $a$  may be replaced by  $b$  in any expression.

If  $n=15$ ,  $3n = 3 \cdot 15$ .

$$y = 2x + 3$$

$$y = x - 7$$

$$x - 7 = 2x + 3$$



## Homework:

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#1 - 14 find "n"

#1 - 8 name the property

#15 - 20 simplify, no properties