

Warm Up:

Give an example of each property.

Transitive Property  $\text{if } m=4 \text{ \& } w=4 \text{ then } m=w$

Identity Property of Addition  $6+0=6$

Associative Property of Addition  $(4+6)+7=4+(6+7)$

Commutative Property of Multiplication

$$6 \times 8 = 8 \times 6$$

# Properties

Commutative

Associative

Identity *add*  $+0$  *mult.*  $\times 1$

Inverse

$$\frac{1}{4} \cdot \frac{4}{1} = 1$$

Zero

Distributive

Reflexive  $3x+2=3x+2$

Symmetric  $5x=10$   $10=5x$

Transitive

~~Substitution~~

Properties of Equality

$$3x+2=8$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$$\begin{array}{r} 3x=6 \\ \hline 3 \quad 3 \end{array}$$

Try these!

Example	What's the Property?
$(3 + 2) + 1 = (2 + 3) + 1$	
$5 \cdot 3 = 3 \cdot 5$	
$(8 + 3) \cdot 0 = 0$	
$(4 \cdot 2) \cdot 3 = (4 \cdot 3) \cdot 2$	
$100 + 0 = 100$	
$1(4) = 4$	
If $x = 4$ , then $3x = 3(4)$	
$-2 + 2 = 0$	
If $6 + 3 = 9$ and $9 = 3(3)$ , then $6 + 3 = 3(3)$	
$2 + (x - 3)1 = 2 + (x - 3)$	
$11 - 2 = 11 - 2$	
If $x + y = 3$ , then $3 = x + y$	
$6 = 6$	
If $3x = 12$ , then $12 = 3x$	

## Solving 2 Step Equations

$$4x + 10 = -14$$

$$\begin{array}{r} -10 \\ -10 \end{array}$$

$$\frac{4x}{4} = \frac{-24}{4}$$

$$x = -6$$

subtraction POE)

inverse +

÷ POE

inverse x)

$$\frac{4}{4} \quad 4 \cdot \frac{1}{4}$$

$$18 - x = -2$$

$$\begin{array}{r} -18 \\ -18 \end{array}$$

$$\frac{-x}{-1} = \frac{-20}{-1}$$

$$x = 20$$

sub. POE

inverse +)

÷ POE

inverse x)

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

$$\frac{2}{3}x + 9 = 21$$

$$\frac{2}{3}x + 9 = 21$$

$$\begin{array}{r} -9 \\ -9 \end{array}$$

sub POE

$$\frac{3}{2} \cdot \frac{2}{3} x = \frac{12 \cdot 3}{1 \cdot 2}$$

inverse +

mult. POE

inverse x

$$x = 18$$

~~$$\frac{3}{2} \cdot \frac{2}{3} x = 12 \cdot 3$$~~

$$2x = \frac{36}{2}$$

$$x = 18$$

Your turn:

$$15 = -5x + 45$$

$$\begin{array}{r} -45 \quad -45 \\ -30 = -5x \\ \hline -5 \quad -5 \end{array}$$

$$x = 6$$

$$14 - 2x = 28$$

$$x = -7$$

$$2/5x - 10 = 30$$

$$x = 100$$

+/- POE  
↓  
inverse +

x / ÷ POE  
↓  
inverse x

$$9x - 7 = -7$$

$$-6 = \frac{n}{2} - 10$$

$$-6 + \frac{x}{4} = -5$$

$$-6k - 13 = 83$$

$$\frac{3}{4}x - 2 = 1$$

$$4b - 4 = 28$$

