

Name: Key

Date: _____

Unit 2

Lesson 1

Do Now:

Identify the following as "expression", "equation", or "inequality".

a) $5x + 4 = 10$

b) $6y - 8$

c) $9b - 4 > 14$

equation
(has = sign)

expression
(no = sign)

inequality
(has $>$, $<$, \geq , \leq symbol)

Algebraic Expressions vs Equations/Inequalities &

Identifying Properties when Solving Equations with the Variable on 1 Side

1. Given $\frac{2}{3}x = 10$. Which value of x will make the sentence true? Identify the property used in each step.

$\frac{3}{2} \left(\frac{2}{3}x = 10 \right) \frac{3}{2}$ OR

~~$\frac{2x}{3} = \frac{10}{1}$~~

OR $\frac{\frac{2}{3}x = 10}{\frac{2}{3}} \frac{2}{3}$

$x = 15$

$\frac{2x}{2} = \frac{30}{2}$

$x = 15$

multiplication property of equality

$x = 15$

- DIVISION Prop. of Eq.

- cross multiply?
- division Prop of Eq.

2. Given $3x + 4 = 16$. Solve and check. Identify the property used in each step.

$3x + 4 = 16$
 $-4 \quad -4$

subtraction property of equality.

$\frac{3x}{3} = \frac{12}{3}$

division property of equality.

$x = 4$

one solution

check: $x = 4$

$3(4) + 4 = 16$

$12 + 4 = 16$

$16 = 16$

True

3. Given $\frac{1}{3}(6b+9)+b=0$. Which value of b will make the sentence true? Identify the property used in each step.

$$\frac{1}{3}(6b+9)+b=0 \quad \text{Distributive property}$$

$$\textcircled{2b} + 3 + \textcircled{b} = 0 \quad \text{combine like terms}$$

$$\begin{array}{r} 3b + 3 = 0 \\ -3 \quad -3 \\ \hline 3b = -3 \\ \frac{3b}{3} = \frac{-3}{3} \\ \boxed{b = -1} \end{array} \quad \begin{array}{l} \text{subtraction property} \\ \text{of equality} \\ \\ \text{Division property} \\ \text{of equality} \\ \text{one solution} \end{array}$$

4. Given $\frac{3x}{8}=12$. Which value of x will make the sentence true? Identify the property used in each step.

$$\left(\frac{8}{3}\right)\frac{3x}{8} = 12\left(\frac{8}{3}\right) \quad \text{multiplication property of equality}$$

$$x = \frac{96}{3}$$

$$\boxed{x = 32} \quad \text{one solution}$$

5. Given $8y-(2y-3)=9$. Solve and check. Identify the property used in each step.

$$8y - (2y - 3) = 9 \quad \text{Distributive property}$$

$$8y - 2y + 3 = 9 \quad \text{Combine like terms}$$

$$\begin{array}{r} 6y + 3 = 9 \\ -3 \quad -3 \\ \hline 6y = 6 \\ \frac{6y}{6} = \frac{6}{6} \end{array} \quad \begin{array}{l} \text{subtraction property} \\ \text{of equality} \\ \\ \text{Division property} \\ \text{of equality} \end{array}$$

$$\boxed{y = 1}$$

one solution

check: $y = 1$

$$8y - (2y - 3) = 9$$

$$8(1) - (2(1) - 3) = 9$$

$$8 - (2 - 3) = 9$$

$$8 - (-1) = 9$$

$$8 + 1 = 9$$

$$9 = 9 \quad \text{True}$$

6. Given $8x + 4 - 3x + 10 = 24$. Which value of x will make the sentence true? Identify the property used in each step.

$8x + 4 - 3x + 10 = 24$ Combine like terms

$$\begin{array}{r} 5x + 14 = 24 \\ -14 \quad -14 \\ \hline \end{array}$$
 Subtraction property of equality

$$\frac{5x}{5} = \frac{10}{5}$$
 Division property of equality

$x = 2$ one solution

check:
 $8(2) + 4 - 3(2) + 10 = 24$
 $16 + 4 - 6 + 10 = 24$
 $20 - 6 + 10 = 24$
 $14 + 10 = 24$
 $24 = 24$ true

7. Which of the following is an equation?

a. $3x - 6$

b. $5m < 10$

c. $7w + 4 = 25$

d. $+8 + 27y$

↓
 Has an equal sign.

7. C

Extra practice:
 Solve:

8. $12 - (3x + 7) = 8$

$12 - 3x - 7 = 8$

$$\begin{array}{r} 5 - 3x = 8 \\ -5 \quad -5 \\ \hline \end{array}$$

$$\frac{-3x}{-3} = \frac{3}{-3}$$

$x = -1$

9. $9x - 3x + 10 = -8$

$$\begin{array}{r} 6x + 10 = -8 \\ -10 \quad -10 \\ \hline \end{array}$$

$$\frac{6x}{6} = \frac{-18}{6}$$

$x = -3$

