

Name: _____

Date: _____

Topic/Objective: SWBAT solve Equations with Variables on both sides

Homework: *yes*

Vocabulary:

Identity: An equation that is true for all values of the variable

Steps for Solving Linear Equations with Variables on both sides

Step 1: Use the distributive Property if needed.

Step 2: Simplify the expression on both sides of the equal sign.

Step 3: Collect variables on one side of the equation and constants on the other side of the equation.

Step 4: Use the inverse operations to solve for the variable.

Examples:

$$\begin{array}{r}
 7 - 8x = 4x - 17 \\
 +8x \quad +8x \\
 \hline
 7 = 12x - 17 \\
 +17 \quad \quad +17 \\
 \hline
 24 = 12x \\
 12 \quad 12 \\
 \boxed{2 = x}
 \end{array}$$

Try on your own:

$$\begin{array}{r}
 24 - 8m = 5m \\
 +3m \quad +3m \\
 \hline
 24 = 8m \\
 8 \quad 8 \\
 \boxed{3 = m}
 \end{array}$$

Examples:

$$9x - 5 = \frac{1}{4} (16x + 60)$$

$$\begin{array}{r}
 9x - 5 = 4x + 15 \\
 -9x \quad -9x \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -5 = -5x + 15 \\
 -15 \quad \quad -15 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -20 = -5x \\
 -5 \quad -5 \\
 \hline
 \end{array}$$

$$\boxed{4 = x}$$

$$20 + c = 4c - 7$$

$$\begin{array}{r}
 20 + c = 4c - 7 \\
 -c \quad \quad -c \\
 \hline
 20 = 3c - 7 \\
 +7 \quad \quad +7 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 27 = 3c \\
 3 \quad 3 \\
 \hline
 \end{array}$$

$$\boxed{9 = c}$$

$$4(9x - 5) = \frac{1}{4} (16x + 60)$$

$$\begin{array}{r}
 36x - 20 = 16x + 60 \\
 +20 \quad \quad +20 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 36x = 16x + 80 \\
 -16x \quad -16x \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 20x = 80 \\
 20 \quad 20 \\
 \hline
 \end{array}$$

$$\boxed{x = 4}$$

Try it again:

$$\begin{array}{r}
 9 - 3k = 17 - 2k \\
 +3k \quad +3k \\
 \hline
 9 = 17 + k \\
 -17 \quad -17 \\
 \hline
 \boxed{-8 = k}
 \end{array}$$

$$\begin{array}{r}
 5x - 2 = 2(3x - 4) \\
 5x - 2 = 6x - 8 \\
 -5x \quad -5x \\
 \hline
 -2 = x - 8 \\
 +8 \quad +8 \\
 \hline
 \boxed{6 = x}
 \end{array}$$

And again....

★ Uh oh... $8y - 6 = \frac{2}{3}(6y + 15)$

$$\begin{array}{r}
 8y - 6 = 4y + 10 \\
 -4y \quad -4y \\
 \hline
 4y - 6 = 10
 \end{array}$$

$$\begin{array}{r}
 4y - 6 = 10 \\
 +6 \quad +6 \\
 \hline
 4y = 16
 \end{array}$$

$$\frac{4y}{4} = \frac{16}{4}$$

$$y = 4$$

$$\frac{2}{3} \cdot \frac{6}{1} = \frac{12}{3} = 4 \quad \left\} \quad \frac{2}{3} \cdot \frac{15}{1} = 10$$