

Name _____

Period _____

Solving Equations With Variables on Both Sides

To solve equations with variables on both
sides of the equation, move the
variables so they are on the same side. (It can be easier
to collect the variables on the side with the term that has the
larger variable
coefficient.)

Example #1 Solve:

$$\begin{array}{r|l} 2x + 3 & = 3x + 5 \\ -2x & -2x \\ \hline \end{array}$$

Subtract $2x$ from each side

$$\begin{array}{r} 3 = x + 5 \\ \hline \end{array}$$

Simplify

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

Subtract 5 from each side

$$\begin{array}{r} -2 = x \\ \hline \end{array}$$

Solution. x is alone.

Example #2 Solve:

$$8n - 4 = 3(2n - 8)$$

$$\underline{8n - 4 = 6n - 24}$$

Use the distributive property

$$\underline{-6n \quad -6n}$$

Subtract 6n from each side

$$\underline{2n - 4 = -24}$$

Simplify

$$\underline{\quad +4 \quad +4}$$

Add 4 to each side

$$\underline{2n = -20}$$

Simplify

$$\underline{\frac{2n}{2} = \frac{-20}{2}}$$

Divide each side by 2

$$\underline{n = -10}$$

Solution. n is alone.

Practice:

1.) $-5x + 6 = x + 12$

$$\begin{array}{r} +5x \quad +5x \\ \hline 6 = 6x + 12 \\ -12 \quad -12 \\ \hline -6 = 6x \\ \frac{-6}{6} = \frac{6x}{6} \quad \boxed{x = -1} \end{array}$$

2.) $7y = 3(5y - 8)$

$$\begin{array}{r} 7y = 15y - 24 \\ -15y \quad -15y \\ \hline -8y = -24 \\ \frac{-8y}{-8} = \frac{-24}{-8} \\ \boxed{y = 3} \end{array}$$

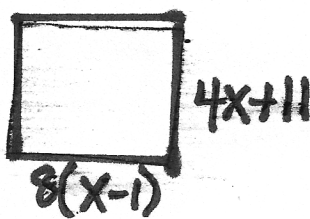
3.) $6(x - 3) = 4(x + 3)$

$$\begin{array}{r} 6x - 18 = 4x + 12 \\ -4x \quad -4x \\ \hline 2x - 18 = 12 \\ +18 \quad +18 \\ \hline 2x = 30 \\ \frac{2x}{2} = \frac{30}{2} \\ \boxed{x = 15} \end{array}$$

4.) $\frac{7p}{2} + 12 = 6 + \frac{5p}{2}$

$$\begin{array}{r} \frac{7p}{2} + 12 = 6 + \frac{5p}{2} \\ -\frac{5p}{2} \quad -\frac{5p}{2} \\ \hline \frac{2p}{2} + 12 = 6 \\ -12 \quad -12 \\ \hline \boxed{p = -6} \end{array}$$

5.) Find the value of x so that the figure is a square.



$$8(x-1) = 4x + 11$$

$$8x - 8 = 4x + 11$$

$$\underline{-4x \quad -4x}$$

$$\underline{4x - 8 = 11}$$

$$\begin{array}{r} 4x = 19 \\ \frac{4x}{4} = \frac{19}{4} \\ \boxed{x = 4\frac{3}{4}} \end{array}$$