

## Solving Multi-Step Equations

1. Simplify each side of the equation by distributing and combining like terms, when necessary.
2. If variables are on both sides of the equation, balance the equation by moving one variable term to the opposite side of the equals sign using inverse operations.
3. Follow the process for solving one- and two-step equations to get the variable by itself.

$$2(x-9) = 3(x-5)$$

$$2x - 18 = 3x - 15$$

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

$$-18 = x - 15$$

$$\begin{array}{r} +15 \\ +15 \end{array} \quad \begin{array}{r} +15 \\ +15 \end{array}$$

$$-3 = x$$

$$-4(5x + 7) = 2x + 8 - 7x$$

$$\begin{array}{r} -20x - 28 = -5x + 8 \\ +5x \quad \quad +5x \end{array}$$

$$\begin{array}{r} -15x - 28 = 8 \\ +28 \quad +28 \end{array}$$

$$\begin{array}{r} -15x = 36 \\ \hline -15 \quad -15 \end{array}$$

$$x = -2\frac{4}{5}$$

$$x = -2\frac{2}{5}$$

$$\frac{1}{2}(-6x + 2) = 4x - 8$$

$$\begin{array}{r} -3x + 1 = 4x - 8 \\ +3x \quad \quad +3x \end{array}$$

$$\begin{array}{r} 1 = 7x - 8 \\ +8 \quad \quad +8 \end{array}$$

$$9 = 7x \quad x = 1\frac{2}{7}$$