

Math 9
Ch. 6 - Linear Equations and Inequalities

Name: _____
Block: _____

6.2 Part 1 - Solving Multi-Step Equations

Some equations have a term containing a variable on both the left- and right-hand sides. To solve, we must gather the variables on one side of the equation and the constants on the other.

To do this, we still use inverse operations.

↓
just a #

Ex. 1: Solve.

(a) $6x + 2 = 10 + 4x$

$$\begin{array}{r} -4x \quad \vdots \quad -4x \\ \hline 2x + 2 = 10 \\ -2 \quad \vdots \quad -2 \\ \hline 2x = 8 \\ \frac{2x}{2} = \frac{8}{2} \\ \hline \boxed{x = 4} \end{array}$$

26 = 26 ✓

(b) $-3c + 7 = 2c - 8$

$$\begin{array}{r} -2c \quad \vdots \quad -2c \\ \hline -5c + 7 = -8 \\ -7 \quad \vdots \quad -7 \\ \hline -5c = -15 \\ \frac{-5c}{-5} = \frac{-15}{-5} \\ \hline \boxed{c = 3} \end{array}$$

$-2 = -2$ ✓

Ex. 2: Solve.

$0.75(t - 120) = 0.25t - 7.5$

$$\begin{array}{r} 0.75t - 90 = 0.25t - 7.5 \\ -0.25t \quad \vdots \quad -0.25t \\ \hline 0.5t - 90 = -7.5 \\ +90 \quad \vdots \quad +90 \\ \hline 0.5t = 82.5 \\ \frac{0.5t}{0.5} = \frac{82.5}{0.5} \\ \hline \boxed{t = 165} \end{array}$$

Ex. 3: To cater a lunch, Tina's Catering charges \$100, plus \$15 per meal. Norman's Catering charges \$25, plus \$20 per meal. Write and solve an equation to determine the number of meals that will result in equal costs at the two companies.

$$\text{Cost for Tina's: } 100 + 15m$$

$$\text{Cost for Norman's: } 25 + 20m$$

* make them equal

$$\begin{array}{r}
 100 + 15m = 25 + 20m \\
 -20m \quad \quad \quad -20m \\
 \hline
 100 - 5m = 25 \\
 -100 \quad \quad \quad -100 \\
 \hline
 -5m = -75 \\
 \frac{-5m}{-5} = \frac{-75}{-5} \\
 \hline
 m = 15
 \end{array}$$