Panel 1

Accelerated Math Notes
(Section 8-5)
Solving Equations with Variables on Each Side

Remember:
A <u>solution</u> to an equation is the value for the variable that makes the equation true.

Is $\boxed{x = -2}$ a solution to the equation $\boxed{6x - 3 = -4x - 23}$?

$$6x - 3 = {}^-4x - 23$$

$6(-2) - 3$	$-4(-2) - 23$
$-12 - 3$	$8 - 23$
-15	$8 + {}^-23$
	-15 ✓

Panel 2

Solve: $7x + 3 = 2x + 23$

$$7x + 3 = 2x + 23$$
$$\underline{-2x \qquad\quad -2x}$$
$$5x + 3 = 23$$
$$\underline{\;\;-3 \quad\;\; -3\;}$$
$$5x = 20$$
$$\frac{5x}{5} = \frac{20}{5}$$
$$\boxed{x = 4}$$

Step 1: Choose x term to add or subtract in order to get all x terms on the same side.

Step 2: Simplify.

Step 3: Add or subtract in order to get constants on same side.

Step 4: Simplify.

Step 5: Divide both sides by coefficient of x term.

Panel 3

Check your solution :

$$7x + 3 = 2x + 23$$

$7(4) + 3$	$2(4) + 23$
$28 + 3$	$8 + 23$
31	31 ✓

Solve another way

$$7x + 3 = 2x + 23$$
$$\underline{-7x \qquad\quad -7x}$$
$$3 = {}^-5x + 23$$
$$\underline{-23 \qquad\quad -23}$$
$$-20 = {}^-5x$$
$$\frac{-20}{-5} = \frac{-5x}{-5}$$
$$\boxed{4 = x}$$

Panel 4

Solve and check: $-n + 8 = 5n - 7$

$$-n + 8 = 5n - 7$$
$$\underline{+n \qquad\quad +n}$$
$$8 = 6n - 7$$
$$\underline{+7 \qquad\quad +7}$$
$$15 = 6n$$
$$\frac{15}{6} = \frac{6n}{6}$$
$$\frac{15}{6} = n$$
$$\frac{5}{2} = n$$

Ck

$$-n + 8 = 5n - 7$$

$-\left(\frac{5}{2}\right) + 8$	$5\left(\frac{5}{2}\right) - 7$
$-2\frac{1}{2} + 8$	$\frac{25}{2} - \frac{14}{2}$
$5\frac{1}{2}$	$\frac{11}{2}$
	$5\frac{1}{2}$ ✓

Box 1

Solve and check: 4x + 15 = 2x - 7

$$4x + 15 = 2x - 7$$
$$\underline{-2x \qquad\qquad -2x}$$
$$2x + 15 = -7$$
$$\underline{\quad -15 \quad -15}$$
$$2x = -22$$
$$\frac{2x}{2} = \frac{-22}{2}$$
$$\boxed{x = -11}$$

$$4x + 15 = 2x - 7$$

$4(-11) + 15$	$2(-11) - 7$
$-44 + 15$	$-22 - 7$
-29	$-29 \checkmark$

Box 2

Solve and check: 2.4 - 3m = 6.4 - 8.8

$$2.4 - 3m = 6.4 - 8.8$$

$$\begin{array}{r} 8.8 \\ -6.4 \\ \hline 2.4 \end{array}$$

$$2.4 + {}^-3m = {}^-2.4$$
$$\underline{-2.4 \qquad\qquad -2.4}$$
$${}^-3m = -4.8$$
$$\frac{-3m}{-3} = \frac{-4.8}{-3}$$
$$\boxed{m = 1.6}$$

$$\begin{array}{r} 4.8 \\ -2.4 \end{array}$$

ck $2.4 - 3m = 6.4 - 8.8$
$$2.4 - 3(1.6)$$
$$2.4 - 4.8$$
$$2.4 + {}^-4.8$$
$$-2.4$$

	6.4 + 8.8
	$\begin{array}{r} 8.8 \\ -6.4 \end{array}$
	$-2.4 \checkmark$

Box 3

A car rental agency has two plans. Under Plan A, a car rents for $80 plus $20 each day. Under Plan B, a car rents for $120 plus $15 a day. What number of days results in the same cost? Write an equation that can be used to solve this problem. Then solve.

Let d = # of days that will result in the same cost

$$\text{cost Plan A} = \text{cost Plan B}$$
$$80 + 20d = 120 + 15d$$
$$\underline{\qquad -15d \qquad\qquad -15d}$$
$$80 + 5d = 120$$
$$\underline{-80 \qquad -80}$$
$$5d = 40$$
$$\frac{5d}{5} = \frac{40}{5} \rightarrow d = 8$$

$$\boxed{8 \text{ days}}$$

Box 4

A cell phone provider offers two plans. Under Plan A, the monthly cost is $20 with a cost of $0.35 per minute. Under Plan B, the monthly cost is $35 with a cost of $0.15 per minute. What number of minutes results in the same cost?

Let m = # of minutes that will result in the same cost

$$\text{Plan A cost} = \text{Plan B cost}$$
$$20 + 0.35m = 35 + 0.15m$$
$$\underline{\quad -.15m \qquad\qquad -.15m}$$
$$20 + .2m = 35$$
$$\underline{-20 \qquad\quad -20}$$
$$.2m = 15$$
$$\frac{.2m}{.2} = \frac{15}{.2}$$
$$m = 75$$

$$\boxed{75 \text{ min}}$$