Accelerated Math Notes
(Lesson 8.2)
Solving Two-Step Equations

*A two-step equation is a mathematical sentence containing two operations.

To solve a two-step equation:

FIRST: Add or subtract a number to each side of the equation.

SECOND: Multiply or Divide a number to each side of the equation.

Solve and check

EX #1 $2m + 8 = -32$

$$2m + 8 = -32$$
$$-8 \quad -8$$
$$\overline{}$$
$$2m = -40$$
$$\frac{2m}{2} = \frac{-40}{2}$$
$$\boxed{m = -20}$$

$-32 - 8$
$+32 + 8$

ok
$$2m + 8 = -32$$
$$2(-20) + 8 \overset{?}{=} -32$$
$$-40 + 8 \overset{?}{=} -32$$
$$-32 = -32 ✓$$

Solve and check

EX #2 $\frac{1}{4}x + 6 = 9$

$$\frac{1}{4}x + 6 = 9$$
$$-6 \quad -6$$
$$\overline{}$$
$$\frac{1}{4}x = 3$$
$$\frac{4}{1} \cdot \frac{1}{4}x = 3 \cdot \frac{4}{1}$$
$$\boxed{x = 12}$$

ok
$$\frac{1}{4}x + 6 = 9$$
$$\frac{1}{4} \cdot 12 + 6 \overset{?}{=} 9$$
$$3 + 6 \overset{?}{=} 9$$
$$9 = 9 ✓$$

Solve and check

EX #3 $-5 - x = -21$

$$-5 - x = -21$$
$$-5 + -1x = -21$$
$$+5 +5$$
$$\overline{}$$
$$-1x = -16$$
$$\frac{-1x}{-1} = \frac{-16}{-1}$$
$$\boxed{x = 16}$$

ok
$$-5 - x = -21$$
$$-5 - 16 \overset{?}{=} -21$$
$$-5 + -16 \overset{?}{=} -21$$
$$-21 = -21 ✓$$

Always Remember to simplify each "side" of the equation

Solve and check

EX #4   b - 3b + 8 = 18

$$b - 3b + 8 = 18$$
$$1b + -3b + 8 = 18$$
$$-2b + 8 = 18$$
$$\qquad -8 \quad -8$$
$$\overline{\qquad\qquad}$$
$$-2b = 10$$
$$\frac{-2b}{-2} = \frac{10}{-2}$$
$$\boxed{b = -5}$$

Ck
$$b - 3b + 8 \overset{?}{=} 18$$
$$-5 - 3(-5) + 8 \overset{?}{=} 18$$
$$-5 + -3(-5) + 8 = 18$$
$$-5 + 15 + 8 = 18$$
$$10 + 8 = 18$$
$$18 = 18 \checkmark$$

Solve and Check

$$8n + 7 - 9n = -8$$
$$-1n + 7 = -8$$
$$\qquad -7 \quad -7$$
$$\overline{\qquad\qquad}$$
$$-1n = -15$$
$$\frac{-1n}{-1} = \frac{-15}{-1}$$
$$\boxed{n = 15}$$

$$8n + 7 - 9n = -8$$
$$8(15) + 7 - 9(15) \overset{?}{=} -8$$
$$120 + 7 + -135 \overset{?}{=} -8$$
$$127 + -135 = -8$$
$$-8 = -8 \checkmark$$

Solve and Check

$$-\frac{2}{3}n - 10 = -12$$
$$\qquad +10 \quad +10$$
$$\overline{\qquad\qquad}$$
$$-\frac{2}{3}n = -2$$
$$-\frac{2}{3}n = -2$$
$$\left(-\frac{3}{2}\right) \cdot -\frac{2}{3}n = -2\left(-\frac{3}{2}\right)$$
$$\boxed{n = 3}$$

Ok
$$-\frac{1}{1} \cdot \frac{3}{2} \qquad -\frac{2}{3}n - 10 = -12$$
$$3 \qquad\qquad -\frac{2}{3} \cdot 3 - 10 \overset{?}{=} -12$$
$$-2 + 10 \overset{?}{=} -12$$
$$-12 = -12 \checkmark$$

Solve and check

$$-\frac{2}{3} - n = -\frac{3}{4}$$
$$-\frac{2}{3} + -n = -\frac{3}{4}$$
$$+\frac{2}{3} \qquad\qquad +\frac{2}{3}$$
$$\overline{\qquad\qquad}$$
$$-1n = -\frac{1}{12}$$
$$\frac{-1n}{-1} = -\frac{1}{12} \cdot -1$$
$$\boxed{n = \frac{1}{12}}$$

$$-\frac{3}{4} + \frac{2}{3} \quad Ck$$
$$-\frac{9}{12} + \frac{8}{12}$$
$$-\frac{1}{12}$$

$$-\frac{2}{3} - n = -\frac{3}{4}$$
$$-\frac{2}{3} - \frac{1}{12} \overset{?}{=} -\frac{3}{4}$$
$$-\frac{8}{12} + -\frac{1}{12} \overset{?}{=} -\frac{3}{4}$$
$$-\frac{9}{12} \overset{?}{=} -\frac{3}{4}$$
$$-\frac{3}{4} = -\frac{3}{4} \checkmark$$