Name: _____   Date: _____

Learning Goal 6.1	I can solve linear equations.

Recall to solve an **equation**

$$3x - 4 = 5$$
$$-4 \quad -4$$

Solving Equations with Variables on Both Sides

- Combine the constants to one side of the equation
  ↳ #s with no variables
- Combine the variable terms to the other side of the equation.
- Multiply or divide to find the variable.

Example Solve the following by simplifying, then applying the opposite operations. Check your answer.

a. $5x = 4x - 4$
$$-4x \quad -4x$$
$$x = -4$$

b. $2y = 2 + 4y$
$$-4y \quad\quad -4y$$
$$\frac{-2y}{-2} = \frac{2}{-2}$$
$$y = -1$$

c. $7m + 8m = -10m + 5$
$$15m = -10m + 5$$
$$+10m \quad\quad +10m$$
$$\frac{25m}{25} = \frac{5}{25}$$
$$m = \frac{5 \div 5}{25 \div 5} = \frac{1}{5}$$

d. $2x - 5x = x + 8$
$$-3x = x + 8$$
$$-x \quad -x$$
$$\frac{-4x}{-4} = \frac{8}{-4}$$
$$x = -2$$

e. $3x + x = 5x - 6$

$4x = 5x - 6$

$-5x \quad -5x$

$-1x - x = -6x - 1$

$x = 6$

f. $-3a + 8 = 4a + 22$

$-4a \qquad -4a$

$-7a + 8 = 22$

$\quad -8 \quad -8$

$-7a = 14$

$\overline{-7} \quad \overline{-7}$

$a = -2$

g. $12 + 2(k + 3) = 3k - 6$

$12 + 2k + 6 = 3k - 6$

$\quad -3k \qquad -3k$

$12 - k + 6 = -6$

$18 - k = -6$

$-18 \qquad -18$

$-1 \times -k = -24 \times -1$

$k = 24$

h. $3(n - 2) - 19 = 5 + 2(n + 5)$

$3n - 6 - 19 = 5 + 2n + 10$

$3n - 25 = 2n + 15$

$-2n \qquad -2n$

$n - 25 = 15$

$+25 \quad +25$

$n = 40$

i. $5(c + 4) = 4(2c - 3) - 7$

$5c + 20 = 8c - 12 - 7$

$-5c \qquad -5c$

$20 = 3c - 12 - 7$

$20 = 3c - 19$

$+19 \qquad +19$

$\dfrac{39}{3} = \dfrac{3c}{3}$

$13 = c$

$c = 13$

j. $4(x + 2) - 3(x + 1) = 2(x + 2)$

$4x + 8 - 3x - 3 = 2x + 4$

$x + 5 = 2x + 4$

$-x \qquad -x$

$5 = x + 4$

$-4 \qquad -4$

$1 = x$

$x = 1$

k. $3(2x - 5) - (x + 3) = 2(x + 1) + 4$

$6x - 15 - x - 3 = 2x + 2 + 4$

$5x - 18 = 2x + 6$

$-2x \qquad -2x$

$3x - 18 = 6$

$+18 \qquad +18$

$\dfrac{3x}{3} = \dfrac{24}{3}$

$x = 8$

l. $12(2x - 1) - 4(-2x - 1) = 2(x + 11)$

$24x - 12 + 8x + 4 = 2x + 22$

$32x - 8 = 2x + 22$

$-2x \qquad -2x$

$30x - 8 = 22$

$+8 \qquad +8$

$\dfrac{30x}{30} = \dfrac{30}{30}$

$x = 1$