Algebra RH – Solving Systems Algebraically (Substitution) **ANSWER KEY** **HW# _____**

1.

$$y = 2x$$
$$5x - y = 30$$

$$5x - 2x = 30$$
$$3x = 30$$
$$x = 10$$

$$y = 2x$$
$$y = 2(10)$$
$$y = 20$$

(10, 20)

2.

$$m = 4n$$
$$3m - 2n = 20$$

$$3(4n) - 2n = 20$$
$$12n - 2n = 20$$
$$10n = 20$$
$$n = 2$$

$$m = 4n$$
$$m = 4(2)$$
$$m = 8$$

(8, 2)

3.

$$3n + 5m = 7$$
$$m - 4n = 6 \longrightarrow m = 4n + 6$$

$$3n + 5(4n + 6) = 7$$
$$3n + 20n + 30 = 7$$
$$23n + 30 = 7$$
$$23n = -23$$
$$n = -1$$

$$m - 4n = 6$$
$$m - 4(-1) = 6$$
$$m + 4 = 6$$
$$m = 2$$

(2, -1)

4.

$$3y - x = -9 \longrightarrow x - 9 = 3y$$
$$2y + 5x = 11 \qquad x = 3y + 9$$

$$2y + 5(3y + 9) = 11$$
$$2y + 15y + 45 = 11$$
$$17y + 45 = 11$$
$$17y = -34$$
$$y = -2$$

$$3y - x = -9$$
$$3(-2) - x = -9$$
$$-6 - x = -9$$
$$-x = -3$$
$$x = 3$$

(3, -2)

5.

$$3x + 2y = 11$$
$$x - 2 = -4y \longrightarrow x = 2 - 4y$$

$$3(2 - 4y) + 2y = 11$$
$$6 - 12y + 2y = 11$$
$$6 - 10y = 11$$
$$-10y = 5$$
$$y = -0.5$$

$$3x + 2(-0.5) = 11$$
$$3x - 1 = 11$$
$$3x = 12$$
$$x = 4$$

(4, -0.5)

6.

$$\frac{1}{2}y - x = 1$$
$$x + y + 7 = 0 \longrightarrow x = -y - 7$$

$$\frac{1}{2}y - (-y - 7) = 1$$
$$\frac{1}{2}y + y + 7 = 1 \qquad x + y + 7 = 0$$
$$\frac{3}{2}y + 7 = 1 \qquad x - 4 + 7 = 0$$
$$\frac{3}{2}y = -6 \qquad x + 3 = 0$$
$$y = -4 \qquad x = -3$$

(-3, -4)