Math 10
Chapter 7 Review

Name: _____Key_____
Block: _____

1. Create a linear system to model each of the following situations. Do not solve.

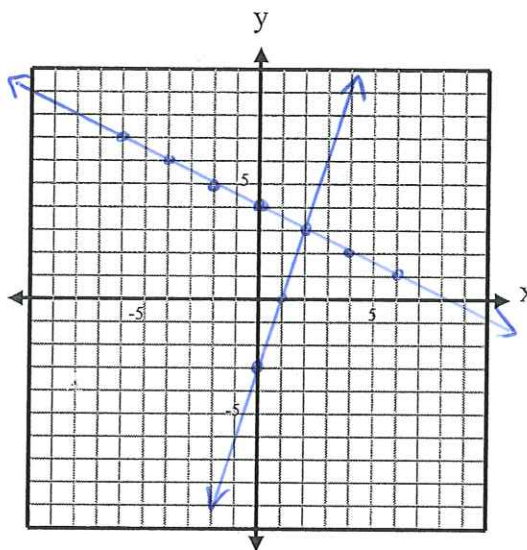   a) The smaller of two numbers is 3 less than the larger number. The sum of the numbers is 45.

   x = smaller number $x = y - 3$
   y = larger number $x + y = 45$

   b) The perimeter of a rectangle is 120 cm. The length is double the width.

   l = length $2l + 2w = 120$
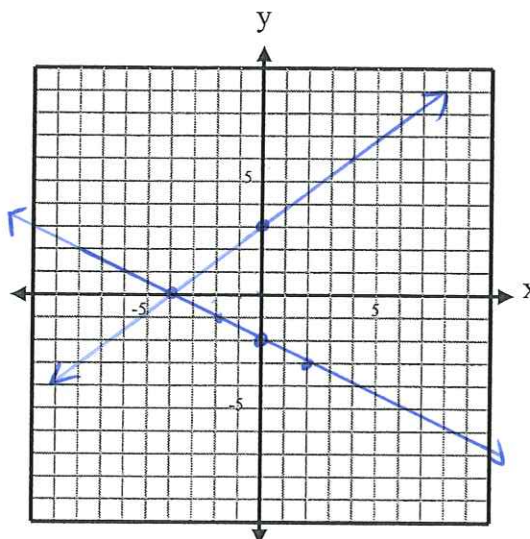 w = width $l = 2w$

2. Solve each of the following systems by graphing:

   a) $y = -\dfrac{1}{2}x + 4$

   $y = 3x - 3$

   Solution: $(2, 3)$

   b) $x + 2y = -4 \rightarrow 2y = -x - 4$

   $4y - 3x = 12$ $y = -\dfrac{1}{2}x - 2$

   $4y = 3x + 12$

   $y = \dfrac{3}{4}x + 3$

   Solution: $(-4, 0)$

3. Solve each of the following systems of equations by <u>substitution</u>.

a)
$$y = 3 - 3x$$
$$2x + 3y = -5$$

$$2x + 3(3 - 3x) = -5$$
$$2x + 9 - 9x = -5$$
$$-7x + 9 = -5$$
$$-7x = -14$$
$$x = 2$$

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

$$\underline{(2, -3)}$$

b)
$$x + y = 7 \rightarrow y = 7 - x$$
$$2x - y = 5$$

$$2x - (7 - x) = 5$$
$$2x - 7 + x = 5$$
$$3x - 7 = 5$$
$$3x = 12$$
$$x = 4$$

$$y = 7 - x$$
$$y = 7 - 4$$
$$y = 3$$

$$\underline{(4, 3)}$$

4. Solve each of the following systems of equations by <u>elimination</u>.

a)
$$3x + 5y = 12$$
$$7x + 5y = 8$$
_____
$$-4x = 4$$
$$x = -1$$

$$3x + 5y = 12$$
$$3(-1) + 5y = 12$$
$$-3 + 5y = 12$$
$$5y = 15$$
$$y = 3$$

$$\underline{(-1, 3)}$$

b) $2x + 8y = 8$
$+$ $-2x + y = 10$

$9y = 18$
$y = 2$

$-2x + y = 10$
$-2x + 2 = 10$
$-2x = 8$
$x = -4$

$(-4, 2)$

c) $2(5x + 2y = 5)$
$3x - 4y = -23$

$10x + 4y = 10$
$+$ $3x - 4y = -23$

$13x = -13$
$\boxed{x = -1}$

$5x + 2y = 5$
$5(-1) + 2y = 5$
$-5 + 2y = 5$
$2y = 10$ $\boxed{y = 5}$

$(-1, 5)$

d) $4(5x + 8y = -2)$
$5(4x + 6y = -2)$

$20x + 32y = -8$
$-$ $20x + 30y = -10$

$2y = 2$
$y = 1$

$5x + 8y = -2$
$5x + 8(1) = -2$
$5x = -10$
$x = -2$

$(-2, 1)$

5. Determine the number of solutions to each of the following systems of equations.

a) $2x + y = 5$ $\rightarrow$ $y = -2x + 5$
   $4x + 2y = 6$
   $\hookrightarrow 2y = -4x + 6$
   $y = -2x + 6$ none

b) $x + y = 3$ $\rightarrow$ $y = -x + 3$
   $4x + 4y = 12$
   $\hookrightarrow 4y = -4x + 12$
   $y = -x + 3$
                                                    infinite

c) $2x + y = 10$ $\rightarrow$ $y = -2x + 10$
   $x + y = 3$
   $y = -x + 3$

                                                    one

6. Given the equation y=-3x + 1, write a second equation to form a system with

   a) no solution $y = -3x - 15$

   b) infinitely many solutions $2y = -6x + 2$