**Chapter 6 Test Review**                Name: _____

**Algebra 1**                            Period: _____   Date: _____

**Tell whether the ordered pair is a solution of the linear system.**

**1.** $(4, -1)$

$4 + 2(-1) = 2$
$4 - 2 = 2$
$2 = 2$ ✓

$x + 2y = 2$
$x - 2y = 6$

$4 - 2(-1) = 6$
$4 + 2 = 6$
$6 = 6$ ✓

$\boxed{Yes}$

**2.** $(8, 5)$

$5(8) - 4(5) = 20$
$40 - 20 = 20$
$20 = 20$ ✓

$5x - 4y = 20$
$3y = 2x + 1$

$3(5) = 2(8) + 1$
$15 = 16 + 1$
$15 \neq 17$  $\boxed{No}$

For numbers 3 & 4, graph the linear system, then answer the following questions:

$y = mx + b$

**3.** $5y = -5x + 20$
$\phantom{5y} 5 \phantom{=} 5 \phantom{+} 5$

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

$m = \dfrac{1}{2}$
$b = 4$

$y = -x + 4$
$m = -1$
$b = 4$
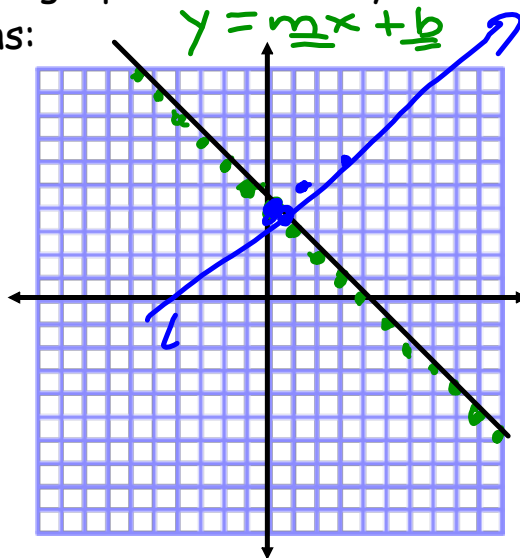


a) What is the solution to the system? $(0, 4)$

b) Find the sum of x and y values.

$0 + 4$
$\boxed{4}$

**4.**  $y = 0$
$\phantom{4.}$ $x = -3$
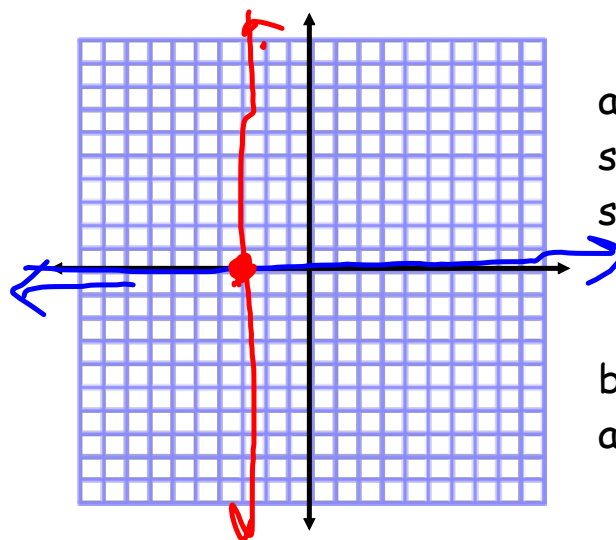


a) What is the solution to the system? $(-3, 0)$

b) Find the sum of x and y values.

$-3 + 0$
$\boxed{-3}$

**Solve the linear system using substitution.**

5. $\boxed{x = y + 1}$
   $x + 2y = 7$

   $(3, 2)$

   $y + 1 + 2y = 7$
   $3y + 1 = 7$
   $\phantom{3y} -1 \quad -1$
   $3y = 6$
   $\frac{3y}{3} = \frac{6}{3}$
   $y = 2$

   $x = 2 + 1$
   $x = 3$

6. $3x + y = 4$
   $\phantom{3}-y \phantom{=4} -3x$
   $4x - 3y = 1$

   $\boxed{y = 4 - 3x}$

   $(1, 1)$

   $4x - 3(4 - 3x) = 1$
   $4x - 12 + 9x = 1$
   $13x - 12 = 1$
   $\phantom{13x} +12 \quad +12$
   $\frac{13x}{13} = \frac{13}{13}$
   $x = 1$

   $y = 4 - 3(1)$
   $y = 4 - 3 = 1$

**Solve the linear system using elimination.**

7. $x = 2y + 4$
   $\phantom{x} -2y \quad -2y$
   $3x + 4y = 2$

   $(2)x - (2)2y = 4(2)$
   $3x + 4y = 2$

   $2x - 4y = 8$
   $+ \; 3x + 4y = 2$
   $\overline{5x = 10}$
   $\frac{5x}{5} = \frac{10}{5}$
   $x = 2$

   $(2, -1)$

   $-2 = 2y + 4$
   $-4 \phantom{=2y} -4$
   $\frac{-6}{2} = \frac{2y}{2}$
   $y = -1$

8. $4x + 3y = 7$
   $7x + 2y = 9$

   $-8x - 6y = -14$
   $21x + 6y = 27$
   $\overline{13x = 13}$
   $x = 1$

   $4 + 3y = 7$
   $-4 \phantom{+3y} -4$
   $\frac{3y}{3} = \frac{3}{3}$
   $y = 1$

   $(1, 1)$

**Determine whether the linear system has *one solution*, no solution, or *infinitely many solutions*.**

9. $3x - y = 5$
   $y = 3x - 5$

   $-3x \quad -3x$
   $3x - y = 5$
   $-3x + y = -5$
   $\overline{0 = 0}$
   *true*
   *Inf many*

10. $y = 2x - 1$
    $y = 2x + 1$

    $+2x - y = +1$
    $- 2x + y = 1$
    $\overline{0 = 2}$
    *False*
    no sol.

11. $3x + y = 12$
    $y = 3x + 12$

    $3x + y = 12$
    $-3x + y = 12$
    $\overline{2y = 24}$
    $y = 12$
    $(, 12)$
    one solution

**12.** The sum of two numbers is $-5$, and the difference of the two numbers is $-17$.

**a)** Write a linear system.

$$x + y = -5$$
$$x - y = -17$$

**b)** Find the numbers.

$$\frac{2x}{2} = \frac{-22}{2}$$
$$x = -11$$

$$-11 + y = -5$$
$$+11 \qquad +11$$
$$y = 6$$

$$\boxed{\begin{array}{c} -11 \\ 6 \end{array}}$$

**13.** Owen went to a farmers market last week bought 6 cantaloupes and 4 watermelons for a total of $36. At the same market, Brendan bought 4 cantaloupes and 5 watermelons for $36.25.

**a)** Write a linear system.

$$(-5) \quad 6C + 4W = 36$$
$$(4) \quad 4C + 5W = 36.25$$

**b)** Find the cost of each cantaloupe and each watermelon.

$$-30C - 20W = -180$$
$$16C + 20W = 145$$
$$\overline{\phantom{xxxx} -14C = -35}$$

$$\boxed{C = \$2.50}$$

$$6(2.50) + 4W = 36$$
$$15 + 4W = 36$$
$$4W = 21$$
$$\boxed{W = 5.25}$$

**c)** How much would it cost to purchase 10 cantaloupes and 3 watermelon?

$$10(2.50) + 3(5.25)$$
$$\boxed{\$40.75}$$

**14. AIR Practice**

A theater sells tickets for a concert. Tickets for lower-level seats sell for $35 each, and tickets for upper-level seats sell for $25 each. The theater sells 350 tickets for $10,250.

How many tickets of each type were sold?

Lower level tickets: $\boxed{150}$

Upper level tickets: $\boxed{200}$

$$x + y = 350 \longrightarrow \boxed{x = 350 - y}$$
$$35x + 25y = 10,250$$

$$35(350 - y) + 25y = 10,250$$

$$12250 - 35y + 25y = 10250$$

$$12250 - 10y = 10250$$
$$-12250 \qquad -12250$$
$$\overline{\phantom{xxxx} \frac{-10y}{-10} = \frac{-2000}{-10}}$$
$$y = 200$$

**15.** Dennis mowed his next door neighbor's lawn for a handful of dimes and nickels, 80 coins in all. Upon completing the job he counted out the coins and it came to $6.60.

**a)** Write a linear system.

$d + n = 80 \longrightarrow d = 80 - n$

$.10\,d + .05n = 6.60$

**b)** How many of each coin did he earn?

$.10(80-n) + .05n = 6.60$

$8 - .10n + .05n = 6.60$

$8 - .05n = 6.60$

$-.05n = -1.40$

$n = 28$

$d = 52$

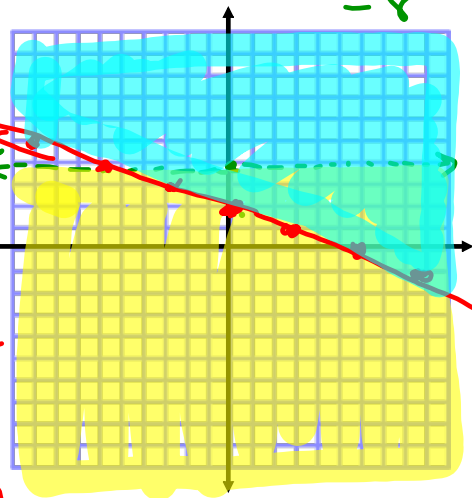**16.** Graph the system of linear inequalities below. Then answer the question:

$y < 4$

$x + 3y \geq 6$

$3y \geq -x + 6$

$\frac{3y}{3} \geq \frac{-x}{3} + \frac{6}{3}$

$y \geq -\frac{1}{3}x + 2$

$m = -\frac{1}{3} \quad b = 2$

Circle all points that are solutions to the system:

(0,0)

(3,3)

(5,2)

(-2,6)

(7,2)

**17. AIR Practice**

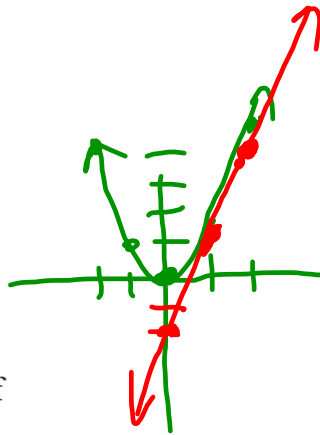A system of equations is shown.

$y = 3x - 2$
$y = x^2$

$m = 3$
$b = -2$

What are the solutions to the system of equations?

(1,1)

(2,4)