

Algebra 2 Chapter 3 Pre-Test

1.) (5 pts each, 10 pts total) Solve each of the following systems of equations by graphing.

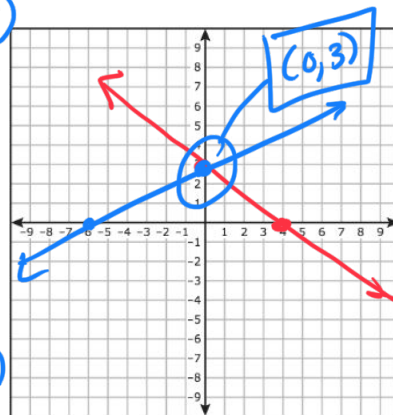
a) $3x + 4y = 12$
 $-x + 2y = 6$

$3x + 4y = 12$
 $x = 0 \quad y = 3$

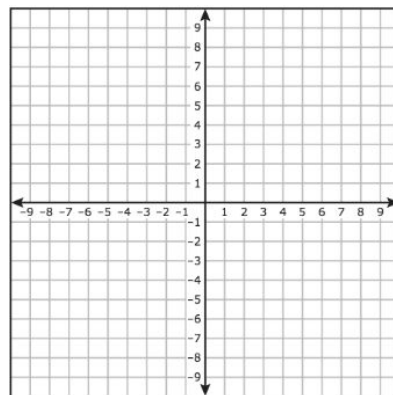
$3x + 4y = 12$
 $x = 4 \quad y = 0$

$-x + 2y = 6$
 $x = 0 \quad y = 3$

$-x + 2y = 6$
 $x = -6 \quad y = 0$



b) $2x + 5y = 10$
 $y = 2x - 2$



2.) (5 pts each, 10 pts total) Solve each of the following systems of equations through substitution.

a) $4x + 2y = 20$
 $y = 2x - 2$

$4x + 2(2x - 2) = 20$

$4x + 4x - 4 = 20$

$8x - 4 = 20$

$+4 \quad +4$

$8x = 24$
 $\frac{8x}{8} = \frac{24}{8}$

$x = 3$

$y = 2x - 2$

$y = 2(3) - 2$

$y = 6 - 2$

$y = 4$

$(3, 4)$

b) $5x - 3y = 7$
 $6x + y = 13$

$$\begin{array}{r} 6x + y = 13 \\ -6x \\ \hline y = -6x + 13 \end{array}$$

3.) (5 pts each, 10 pts total) Solve each of the following systems of equations through elimination.

a) $2x + 7y = -8$
 $x - 4y = 11$

$$\begin{array}{r} 2x + 7y = -8 \\ -2(x - 4y = 11) \\ \hline \end{array}$$

$$\begin{array}{r} 2x + 7y = -8 \\ -2x + 8y = -22 \\ \hline 15y = -30 \\ 15 15 \end{array}$$

$$(3, -2)$$

$$\begin{array}{r} x - 4y = 11 \\ x - 4(-2) = 11 \\ x + 8 = 11 \\ -8 -8 \end{array}$$

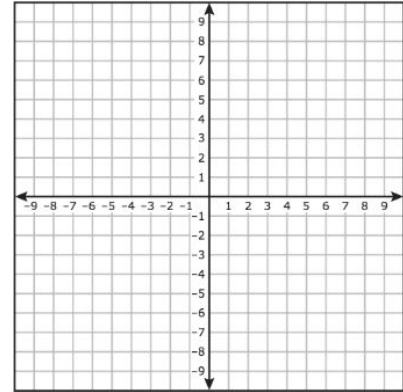
$$x = 3$$

$$y = -2$$

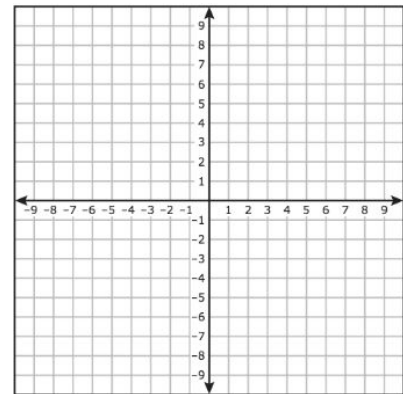
b) $4x - 5y = 31$
 $2x + 3y = -1$

4.) (5 pts each, 10 pts total) Solve each of the following systems of equations through any method.

a) $3x + 4y = -21$
 $-4x - 4y = 16$



b) $8x + 4y = 16$
 $y = -4x + 5$



5.) (5 pts each, 15 pts total) Solve each of the following systems of inequalities by graphing.

a) $x + y > 2$
 $x - y \leq 4$

$x + y = 2$ (0,2)
 $x=0$ $y=2$

$x + y = 2$ (2,0)
 $x=2$ $y=0$

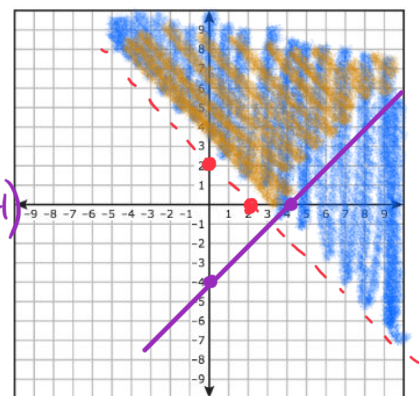
$\{(0,0)\}$ $x + y > 2$
 $0 > 2$

$x - y \leq 4$

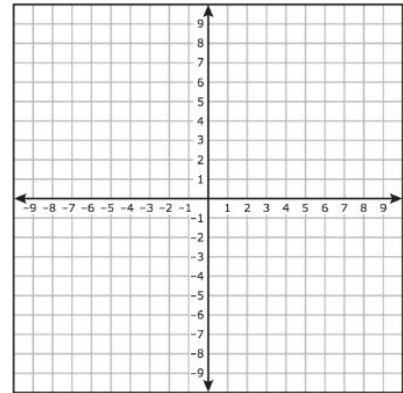
$x - y = 4$ (0,-4)
 $x=0$ $y=-4$

$x - y = 4$ (4,0)
 $x=4$ $y=0$

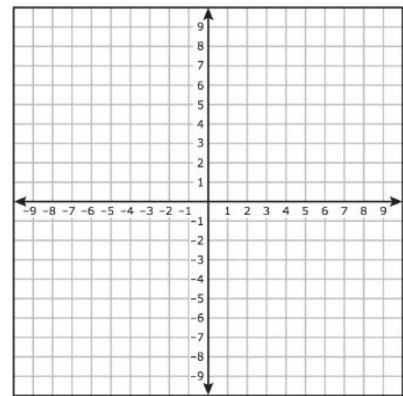
$\{(0,0)\}$ $0 - 0 \leq 4$
 $0 \leq 4$ true



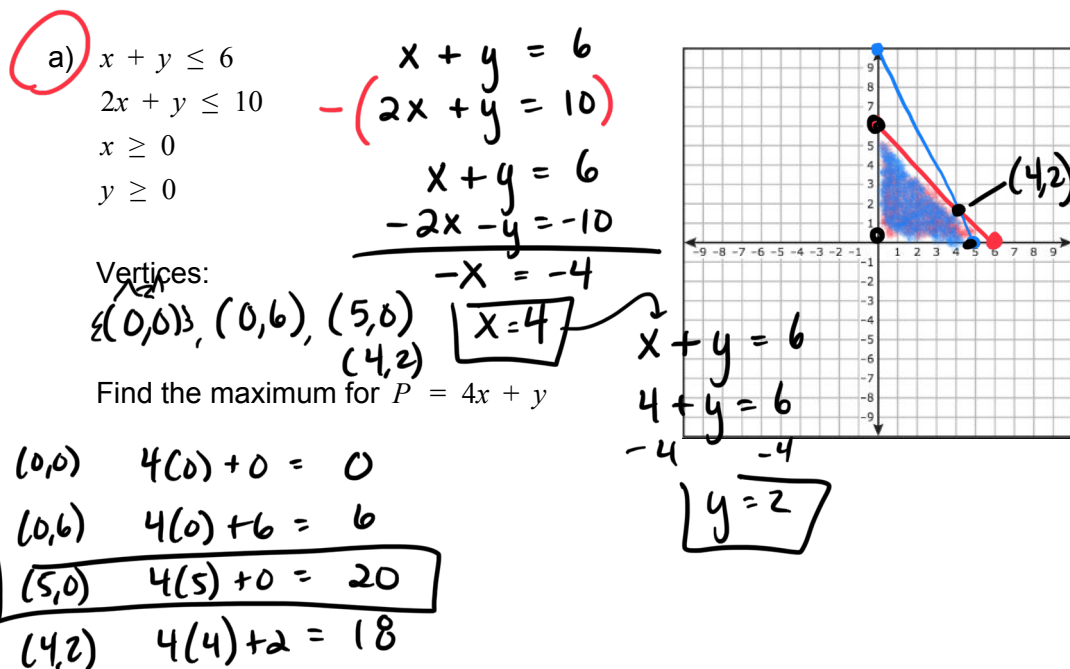
b) $2x + y > 2$
 $x - y \geq 3$



c) $y > 3x + 2$
 $y \leq -2x + 1$



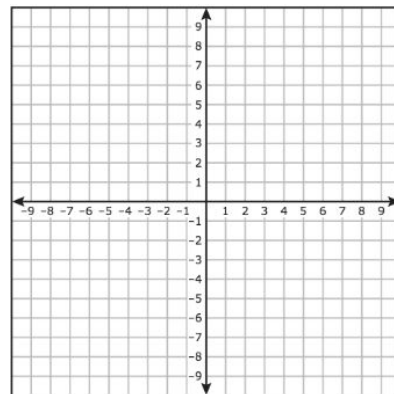
6.) (10 pts each, 20 pts total) Graph each system of constraints. Name all vertices. Then find the values of x and y that maximize or minimize the objective function.



b) $4x + 2y \leq 4$
 $2x + 4y \leq 4$
 $x \geq 0$
 $y \geq 0$

Vertices:

Find the ~~minimum~~ ^{maximum} for $P = 3x + y$



7.) (various pts each, 25 pts total) Solve each system using elimination.

a) (10 pts) Solve.

$$\begin{aligned} \textcircled{1} \quad & 2x - 3y + z = -3 \\ \textcircled{2} \quad & x - 5y + 7z = -11 \\ \textcircled{3} \quad & -10x + 4y - 6z = 28 \end{aligned}$$

$$\begin{cases} \textcircled{2} \quad x - 5y + 7z = -11 \\ \textcircled{3} \quad -10x + 4y - 6z = 28 \end{cases}$$

$$\begin{aligned} 10x - 50y + 70z &= -110 \\ -10x + 4y - 6z &= 28 \\ \hline -46y + 64z &= -82 \end{aligned}$$

$$\textcircled{5} \quad -23y + 32z = -41$$

$$7y - 13z = 19$$

$$7y - 13(-2) = 19$$

$$7y + 26 = 19$$

$$-26 \quad -26$$

$$\frac{7y}{7} = \frac{-7}{7}$$

$$\boxed{y = -1}$$

$$(-2, -1, -2)$$

$$\textcircled{1} \quad 2x - 3y + z = -3$$

$$\textcircled{2} \quad x - 5y + 7z = -11$$

$$\begin{aligned} 2x - 3y + z &= -3 \\ -2x + 10y - 14z &= 22 \end{aligned}$$

$$\textcircled{4} \quad 7y - 13z = 19$$

$$\begin{aligned} \textcircled{4} \quad & 7y - 13z = 19 \\ \textcircled{5} \quad & -23y + 32z = -41 \end{aligned}$$

$$\begin{aligned} 161y - 299z &= 437 \\ -161y + 224z &= -287 \end{aligned}$$

$$\begin{aligned} -75z &= 150 \\ -75 & \quad -75 \end{aligned}$$

$$\boxed{z = -2}$$

$$x - 5y + 7z = -11$$

$$x - 5(-1) + 7(-2) = -11$$

$$x + 5 - 14 = -11$$

$$x - 9 = -11$$

$$+9 \quad +9$$

$$\boxed{x = -2}$$

b) (2.5 pts) Graph the above solution.

