

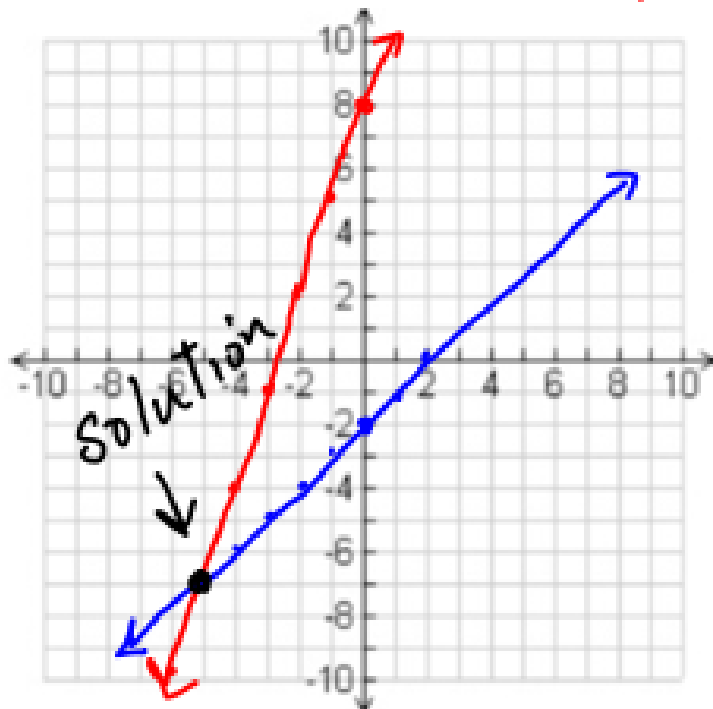
Chapter 5 Review

1) Solve the system by graphing.

$$a) \begin{cases} -3x + y = 8 \rightarrow y = 3x + 8 \\ -x + y = -2 \rightarrow y = x - 2 \end{cases}$$

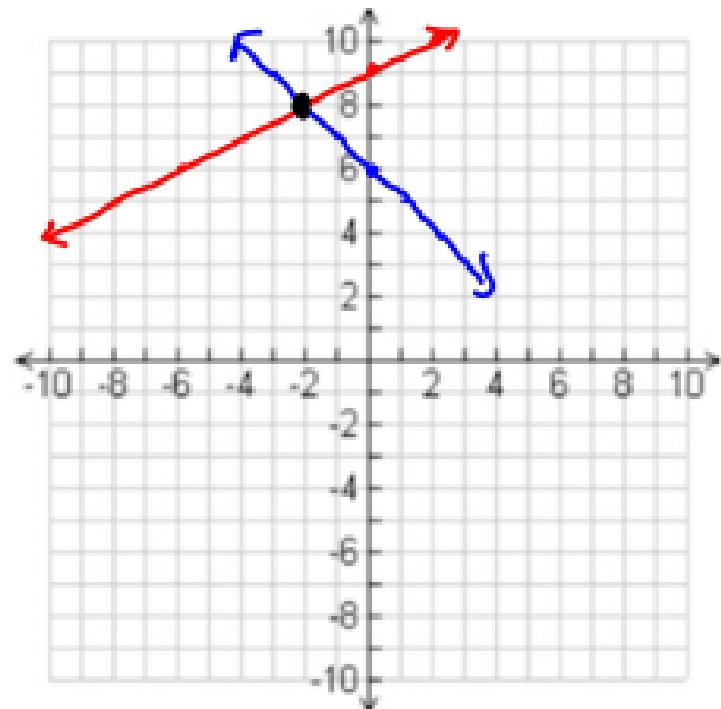
$$(x, y) = (-5, -7)$$

Consistent Independent



$$b) \begin{cases} x - 2y = -18 \rightarrow y = \frac{1}{2}x + 9 \\ x + y = 6 \rightarrow y = -x + 6 \end{cases}$$

$$(x, y) = (-2, 8)$$



II) Solve the system by substitution.

$$a) \begin{cases} x + 2y = 6 \rightarrow x = \boxed{-2y + 6} \\ 5x + 3y = 2 \end{cases}$$

$$5(-2y + 6) + 3y = 2$$

$$-10y + 30 + 3y = 2$$

$$-7y + 30 = 2$$

$$\begin{array}{r} -30 \quad -30 \\ \hline -7y = -28 \end{array}$$

$$-7y = -28$$

$$y = \boxed{4}$$

$$x = -2(4) + 6 = -8 + 6 = -2$$

$$(x, y) = (-2, 4)$$

$$b) \begin{cases} 5x + 6y = -11 \\ 3x + y = -4 \rightarrow y = \boxed{-3x - 4} \end{cases}$$

$$5x + 6(-3x - 4) = -11$$

$$5x - 18x - 24 = -11$$

$$-13x - 24 = -11$$

$$\begin{array}{r} +24 \quad +24 \\ \hline -13x = 13 \end{array}$$

$$-13x = 13$$

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

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

$$(x, y) = (-1, -1)$$

III) Solve the system by elimination.

$$a) \begin{cases} -5(3x - 5y = 7) \\ 3(5x - 2y = -1) \end{cases}$$

$$\begin{array}{r} -15x + 25y = -35 \\ 15x - 6y = -3 \\ \hline \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Add}$$

$$19y = -38$$
$$y = -2$$

$$3x - 5(-2) = 7$$

$$3x + 10 = 7$$

$$\begin{array}{r} -10 \quad -10 \\ \hline \end{array}$$

$$3x = -3$$

$$x = -1$$

$$(x, y) = (-1, -2)$$

$$b) \begin{cases} -3(4x + 3y = 9) \\ 4(3x + 4y = 12) \end{cases}$$

$$\begin{array}{r} -12x - 9y = -27 \\ 12x + 16y = 48 \\ \hline \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Add}$$

$$7y = 21$$

$$y = 3$$

$$4x + 3(3) = 9$$

$$4x + 9 = 9$$

$$4x = 0$$

$$x = 0$$

$$(x, y) = (0, 3)$$

IV) Set up the system and Solve

a) The sum of two numbers is 2 and their difference is 8. Find the two numbers.

$$\begin{cases} x+y=2 \\ x-y=8 \end{cases} \left. \vphantom{\begin{cases} x+y=2 \\ x-y=8 \end{cases}} \right\} \text{Add}$$

$$2x=10$$

$$x=5$$

$$\begin{aligned} 5+y &= 2 \\ y &= -3 \end{aligned}$$

$$(x,y) = (5,-3)$$

b) The sum of two numbers is -5 and their difference is 9. Find the two numbers.

$$\begin{cases} x+y=-5 \\ x-y=9 \end{cases} \left. \vphantom{\begin{cases} x+y=-5 \\ x-y=9 \end{cases}} \right\} \text{Add}$$

$$2x=4$$

$$x=2$$

$$\begin{aligned} 2+y &= -5 \\ y &= -7 \end{aligned}$$

$$(x,y) = (2,-7)$$

V) Graph the linear inequalities.

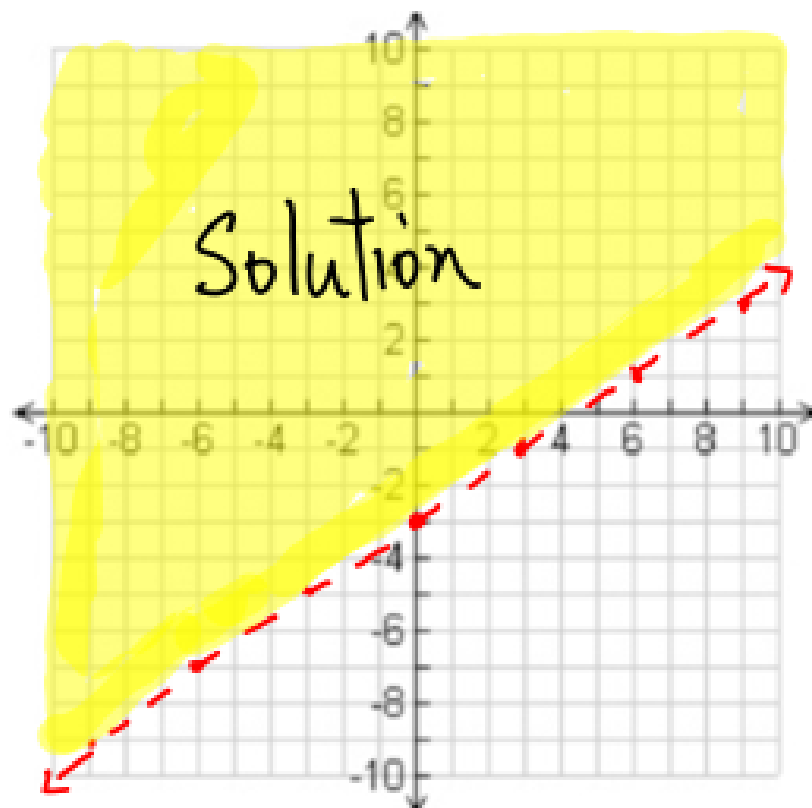
a) $2x - 3y < 9$

$$-3y < -2x + 9$$

$$y > \frac{2}{3}x - 3$$

Test $(0,0)$: $2(0) - 3(0) < 9$

$0 < 9$ True



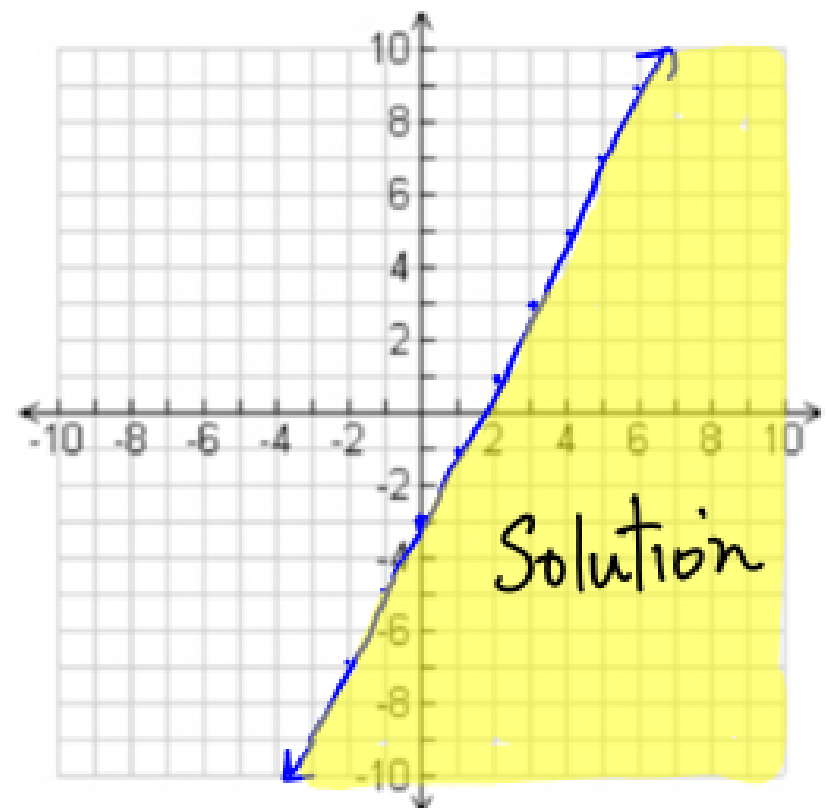
b) $4x - 2y \geq 6$

$$-2y \geq -4x + 6$$

$$y \leq 2x - 3$$

Test $(0,0)$: $4(0) - 2(0) \geq 6$

$0 \geq 6$ False



VI) Graph the system of linear inequalities.

$$a) \begin{cases} 3x + 2y > 4 \rightarrow 2y > -3x + 4 \\ 3x + 6y < -12 \end{cases} \quad y > -\frac{3}{2}x + 2$$

$$6y < -3x - 12$$

$$y < -\frac{1}{2}x - 2$$

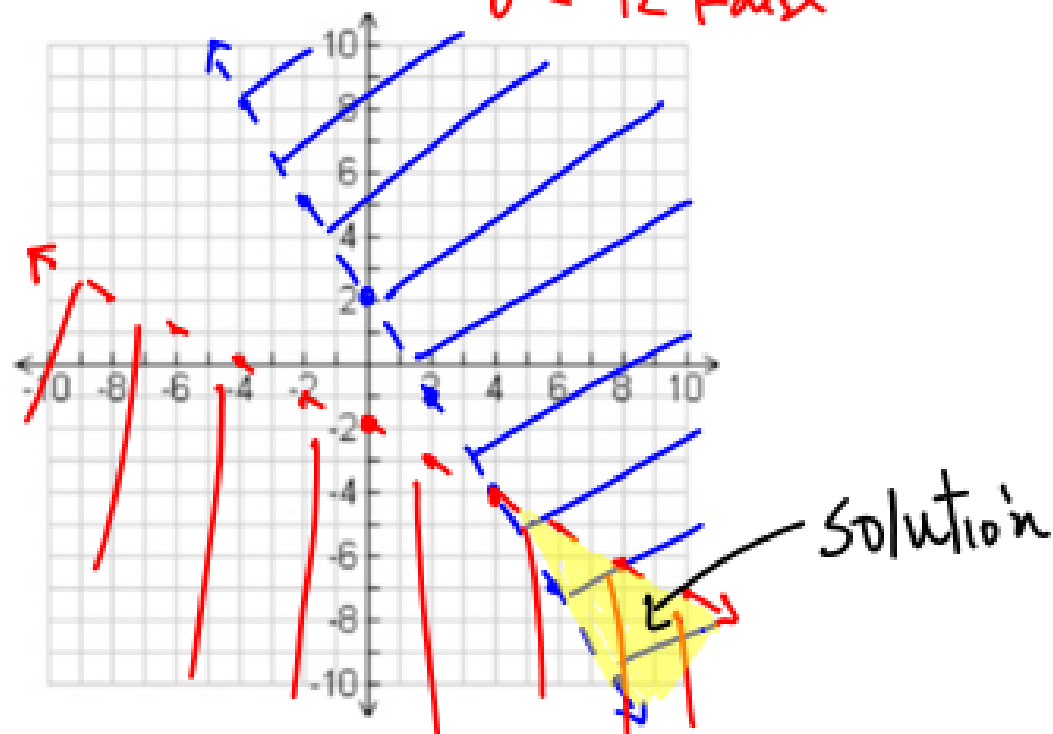
$$\text{Test } (0,0) : 3(0) + 6(0) < -12$$

$$0 < -12 \text{ False}$$

$$\text{Test } (0,0) :$$

$$3(0) + 2(0) > 4$$

$$0 > 4 \text{ False}$$



$$b) \begin{cases} x - 3y \leq 3 \rightarrow -3y \leq -x + 3 \\ 2x - 6y \geq -24 \end{cases} \quad y \geq \frac{1}{3}x - 1$$

$$-6y \geq -2x - 24$$

$$y \leq \frac{1}{3}x + 4$$

$$\text{Test } (0,0) : 0 \geq -24 \checkmark$$

$$\text{Test } (0,0)$$

$$0 \leq 3 \checkmark$$

