

$$2x + 3y = 12$$

$$y = \frac{1}{3}x - 3$$

Solve using substitution

$$2x + 3\left(\frac{1}{3}x - 3\right) = 12$$

$$2x + x - 9 = 12$$

+9 +9

$$2x + 3y = 12$$

$$2(7) + 3y = 12$$

$$14 + 3y = 12$$

-14 -14

$$\frac{3y}{3} = \frac{-2}{3}$$

$$y = -\frac{2}{3}$$

$$\frac{3x}{3} = \frac{21}{3}$$

$$x = 7$$

Solve using substitution.

$$x + 2y = 6$$

$$x - 8y = -34$$

$$x + 2y = 6$$

$$-2y - 2y$$

$$x = -2y + 6$$

$$-2y + 6 - 8y = -34$$

$$-10y + 6 = -34$$

-6 -6

$$\frac{-10y}{-10} = \frac{-40}{-10}$$

$$y = 4$$

$$x = -2y + 6$$

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

$$x = -8 + 6$$

$$x = -2$$

$$(-2, 4)$$

$$\boxed{3} \begin{pmatrix} -5x + 4y = \boxed{2} \\ 15x + 9y = 57 \end{pmatrix}$$

$$\begin{array}{r} -15x + 12y = 6 \\ + 15x + 9y = 57 \\ \hline 21y = 63 \\ \frac{21y}{21} = \frac{63}{21} \end{array}$$

$$\boxed{y = 3}$$

$$\begin{array}{r} 6x - 4y = 22 \\ -2(9x - 2y = 29) \end{array}$$

$$\begin{array}{r} 6x - 4y = 22 \\ + -18x + 4y = -58 \\ \hline -12x = -36 \\ \frac{-12x}{-12} = \frac{-36}{-12} \end{array}$$

$$\boxed{x = 3}$$

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

Solve using elimination

$$-5x + 4y = 2$$

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

$$\begin{array}{r} -5x + 12 = 2 \\ -12 \quad -12 \end{array}$$

$$\begin{array}{r} -5x = -10 \\ \frac{-5x}{-5} = \frac{-10}{-5} \end{array}$$

$$\boxed{x = 2}$$

Solve using elimination.

$$-2 * -2 = +4$$

$$9x - 2y = 29$$

$$9(3) - 2y = 29$$

$$\begin{array}{r} 27 - 2y = 29 \\ -27 \quad -27 \end{array}$$

$$-2y = 2$$

$$\frac{-2y}{-2} = \frac{2}{-2}$$

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

System of Inequalities

$$y < 2x + 3$$

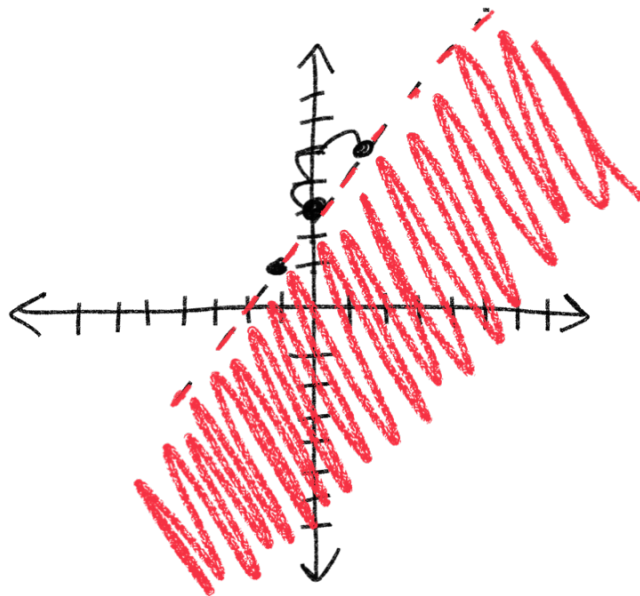
\swarrow y-int
 \uparrow slope = 2 $\frac{\text{up } 2}{\text{right } 1}$

Test $(0,0)$

$$y < 2x + 3$$

$$0 < 2(0) + 3$$

$0 < 3$ true



$$4x - 8y > 24$$

$$4x - 8y > 24$$

$-4x$ $-4x$

$$\frac{-8y}{-8} > \frac{-4x + 24}{-8}$$

Flip!!

$$y < \frac{1}{2}x - 3$$

\swarrow y-int
 \uparrow slope $\frac{\text{up } 1}{\text{right } 2}$

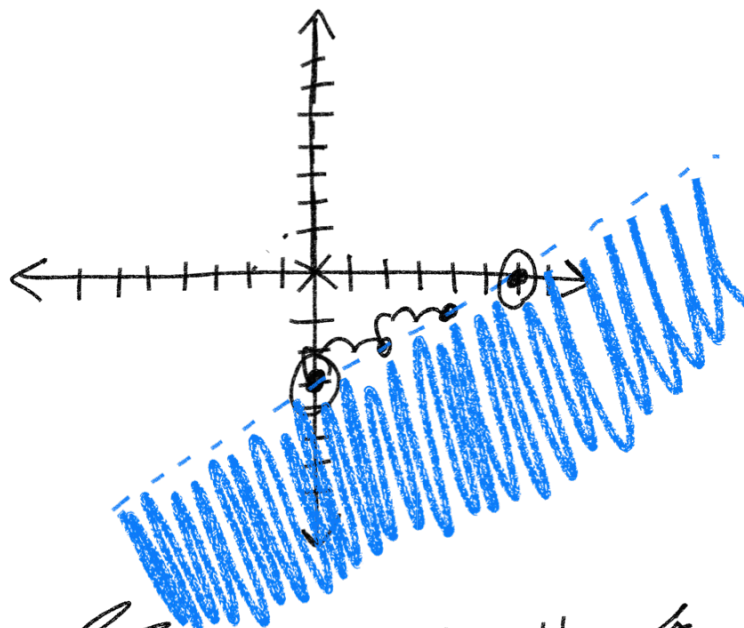
$$4x - 8y > 24$$

$$4(0) - 8(0) > 24$$

$$0 - 0 > 24$$

$$0 > 24$$

false



$$4x - 8y = 24$$

$\frac{4x}{-8} - \frac{8y}{-8} = \frac{24}{-8}$

$$\frac{4x}{-8} - y = -3$$

$\frac{4x}{-8} - y = -3$

$$x = 6$$

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

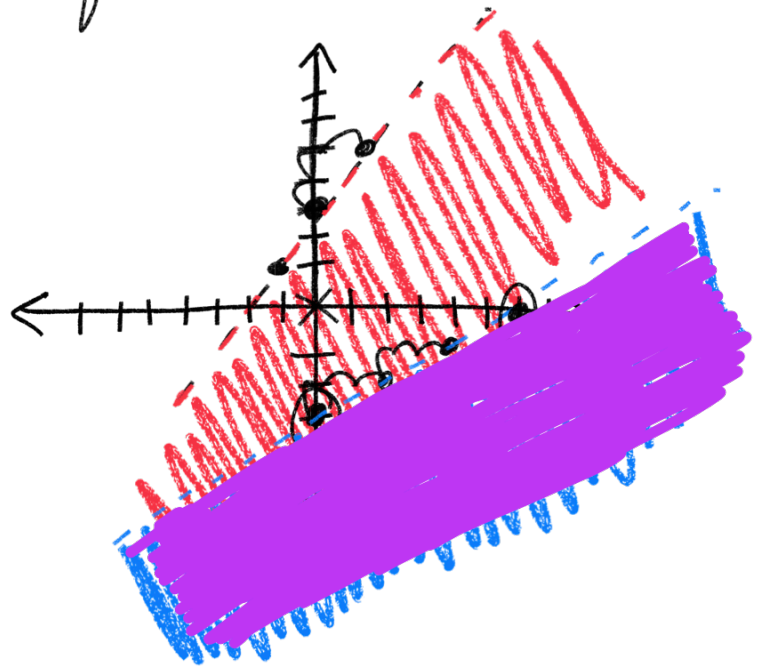
$y = -3$

$(6, 0)$

Solve the system of inequalities

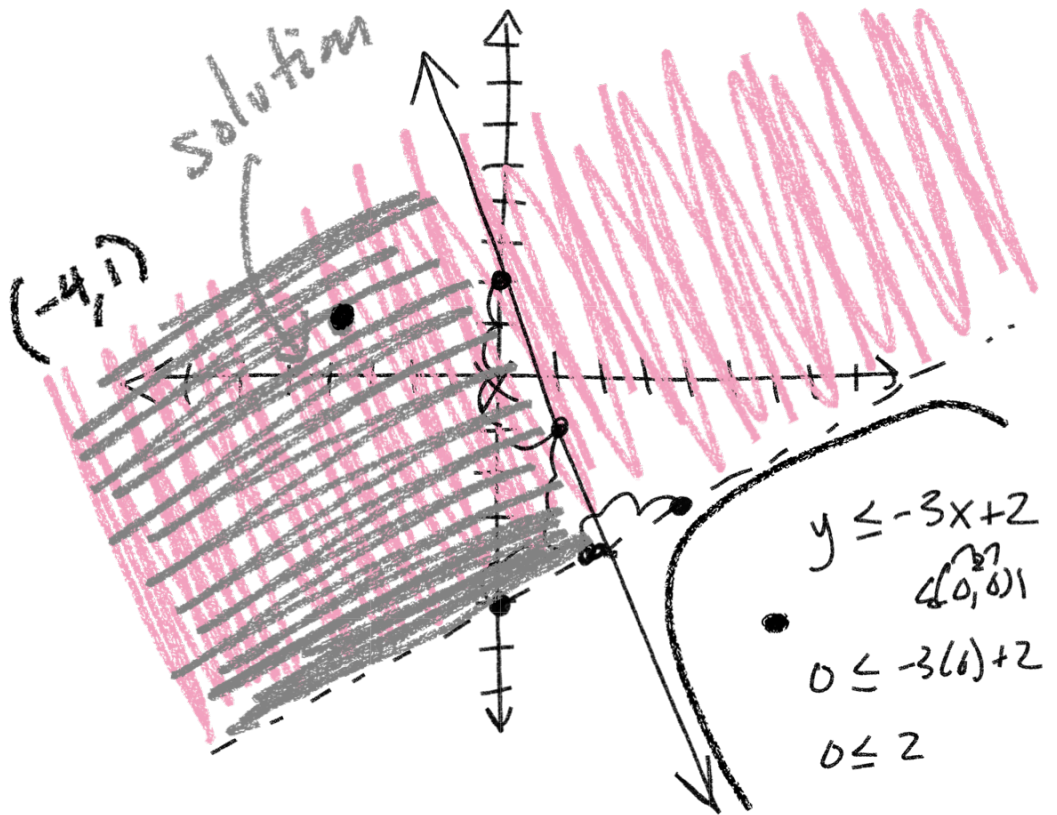
$$y < 2x + 3$$

$$4x - 8y > 24$$



$$y > \frac{1}{2}x - 5$$

$$y \leq -3x + 2$$



$$y > \frac{1}{2}x - 5$$

$$0 > \frac{1}{2}(0) - 5$$

$$0 > -5$$

true!

$$y \leq -3x + 2$$

$$(0, 0)$$

$$0 \leq -3(0) + 2$$

$$0 \leq 2$$

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

$$y \geq 4x - 5$$

$y < \frac{2}{3}x - 2$
test $(0,0)$

$$0 < \frac{2}{3}(0) - 2$$

$$0 < -2 \text{ false}$$

$y \geq 4x - 5$
test $(0,0)$

$$0 \geq 4(0) - 5$$

$$0 \geq -5 \text{ true!}$$

