

$$2x + 3y = 12$$

$$y = \left[\frac{1}{3}x - 3 \right]$$

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

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

$$3x - 9 = 12$$

$$+9 \quad +9$$

$$3x = 21$$

$$\frac{3}{3} \quad \frac{3}{3}$$

$$\boxed{x = 7}$$

$$x + 2y = 6$$

$$x - 8y = -34$$

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

$$6 - 10y = -34$$

$$-6 \quad -6$$

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

$$\boxed{y = 4}$$

Solve using substitution.

$$2x + 3y = 12$$

$$x = 7$$

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

$$14 + 3y = 12$$

$$-14 \quad -14$$

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

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

$$x + 2y = 6$$

$$-2y \quad -2y$$

$$x = \boxed{6 - 2y}$$

$$x = 6 - 2y$$

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

$$x = 6 - 8$$

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

$$\boxed{(-2, 4)}$$

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

$$15x + 9y = 57$$

$$~~-15x + 12y = 6~~$$

$$+ 15x + 9y = 57$$

$$\frac{21y}{21} = \frac{63}{21}$$

$$y = 3$$

Solve using elimination

$$15x + 9(3) = 57$$

$$15x + 27 = 57$$
$$-27 \quad -27$$

$$\frac{15x}{15} = \frac{30}{15}$$

$$x = 2$$

$$(2, 3)$$

$$6x - 4y = 22$$

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

$$6x - 4y = 22$$

$$+ -18x + 4y = -58$$

$$\frac{-12x}{-12} = \frac{-36}{-12}$$

$$x = 3$$

Solve using elimination.

$$6(3) - 4y = 22$$

$$18 - 4y = 22$$
$$-18 \quad -18$$

$$\frac{-4y}{-4} = \frac{4}{-4}$$

$$y = -1$$

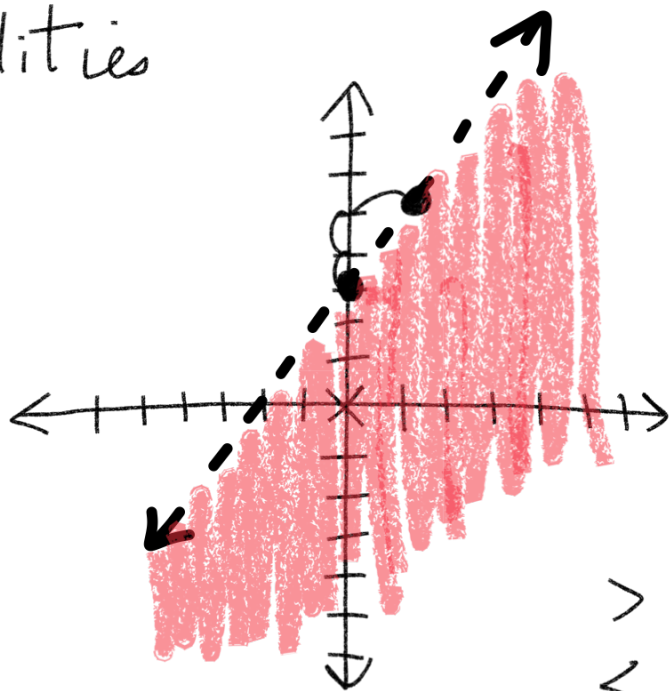
$$(3, -1)$$

System of Inequalities

$y < 2x + 3$
 ↙ dashed

treat as $y = mx + b$
 $y = 2x + 3$
 slope = 2
 $\frac{up\ 2}{1\ right}$
 slope y-int

$> < \dots \geq \leq$
 - - - - - /



$>$ up ↑
 $<$ down ↓

test
 $(0, 0)$

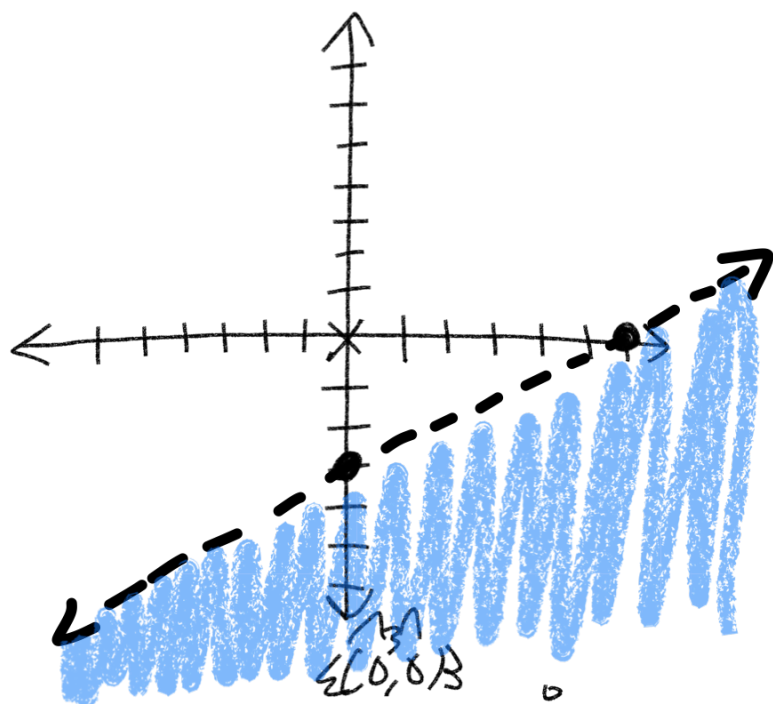
$y < 2x + 3$
 $0 < 2(0) + 3$
 $0 < 3$ true

$4x - 8y > 24$

$x = 0$
 $4(0) - 8y = 24$

$(0, -3)$
 $\frac{-8y}{-8} = \frac{24}{-8}$
 $y = -3$

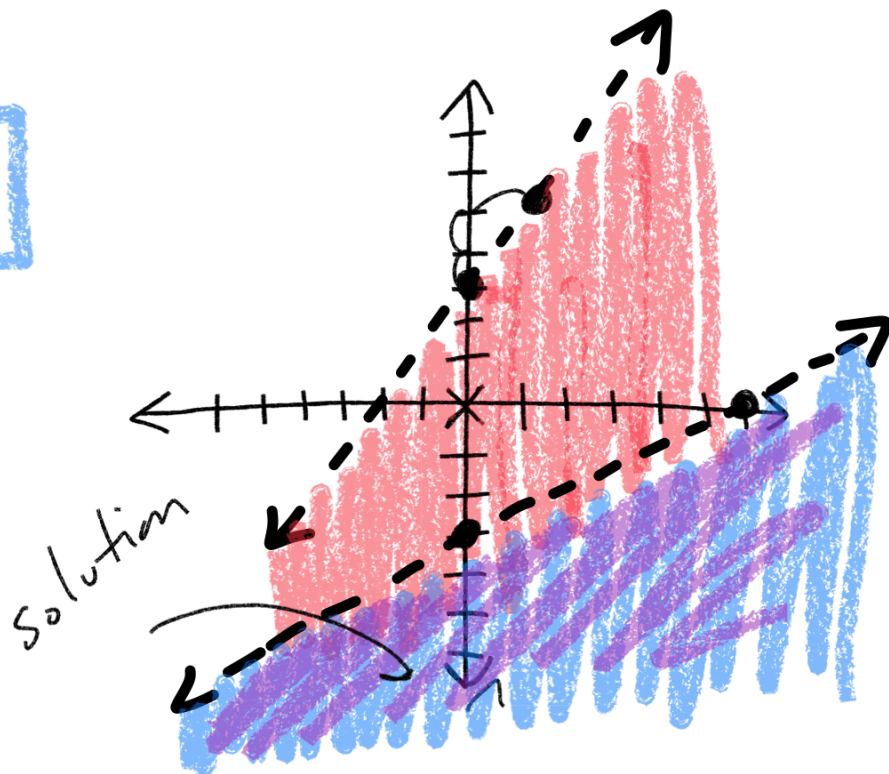
$y = 0$
 $4x - 8(0) = 24$
 $\frac{4x}{4} = \frac{24}{4}$
 $(6, 0)$
 $x = 6$



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

$$y < 2x + 3$$

$$4x - 8y > 24$$



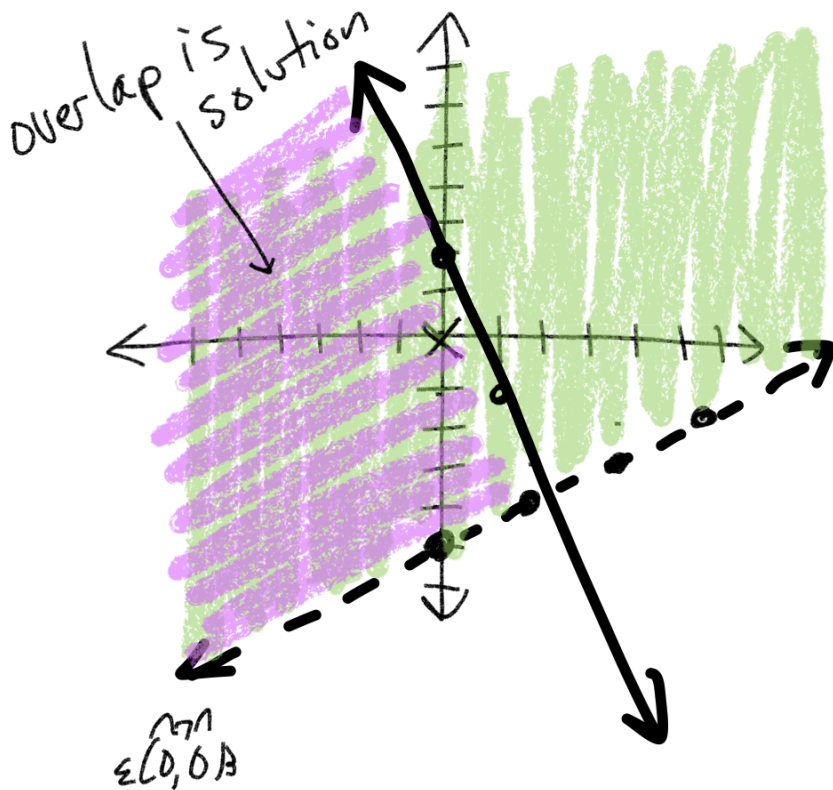
$$y > \frac{1}{2}x - 5$$

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

$\begin{matrix} \sim \\ \sim \\ \sim \end{matrix}$
 $(0,0)$

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

$$0 \leq 2$$



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

$$0 > -5 \text{ true}$$

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

$$y \geq 4x - 5$$

^{test}
 $\{(0,0)\}$

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

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

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

^{test}
 $\{(0,0)\}$

$$y \geq 4x - 5$$

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

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

