

# 5.6 Solving System of Linear Inequalities

Last class: Solving Linear Inequalities

$$y \textcircled{>} \frac{2}{3}x + 2 \quad \leftarrow \text{---} \rightarrow$$

$$\leftarrow \text{---} \rightarrow \quad \geq \text{ or } \leq$$

$$\leftarrow \text{---} \rightarrow \quad > \text{ or } <$$

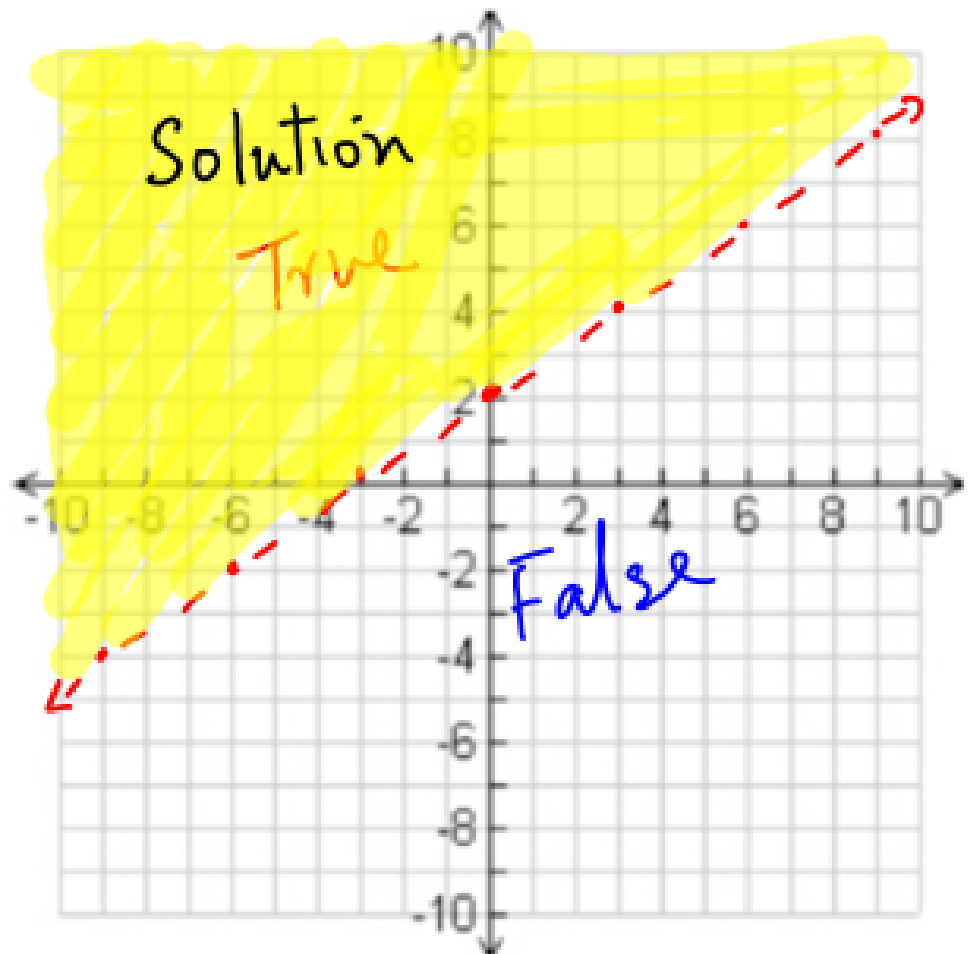
**Step 1:** Graph both equations

**Step 2:** Test Region

**Solution:** Shaded Region!!

Test (0,0)

$$0 > \frac{2}{3}(0) + 2 \quad \times$$

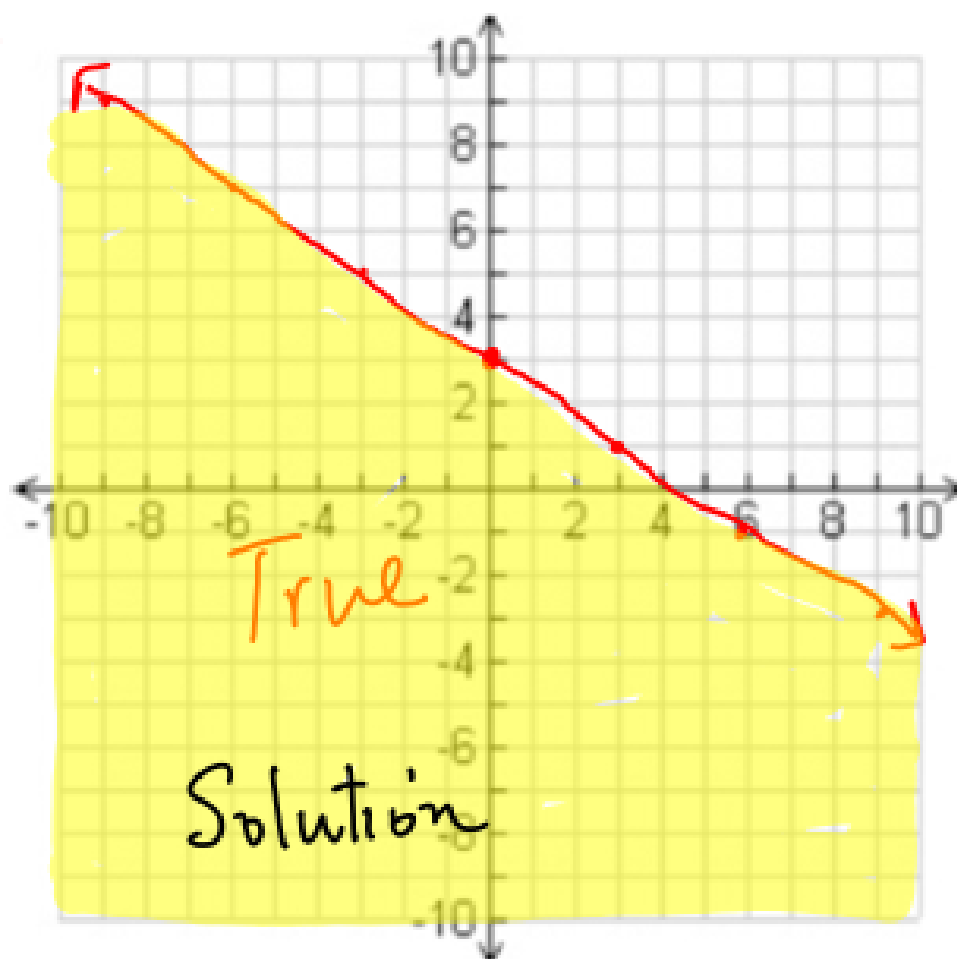


Try this)  $2x + 3y \leq 9$

$$3y \leq -2x + 9$$

$$y \leq -\frac{2}{3}x + 3$$

Test  $(0, 0)$ :  $2(0) + 3(0) \leq 9$  ✓



$$\text{Ex1) } \begin{cases} y \leq x+2 & \leftarrow \text{red arrow} \\ y > x-1 & \leftarrow \text{blue dashed arrow} \end{cases}$$

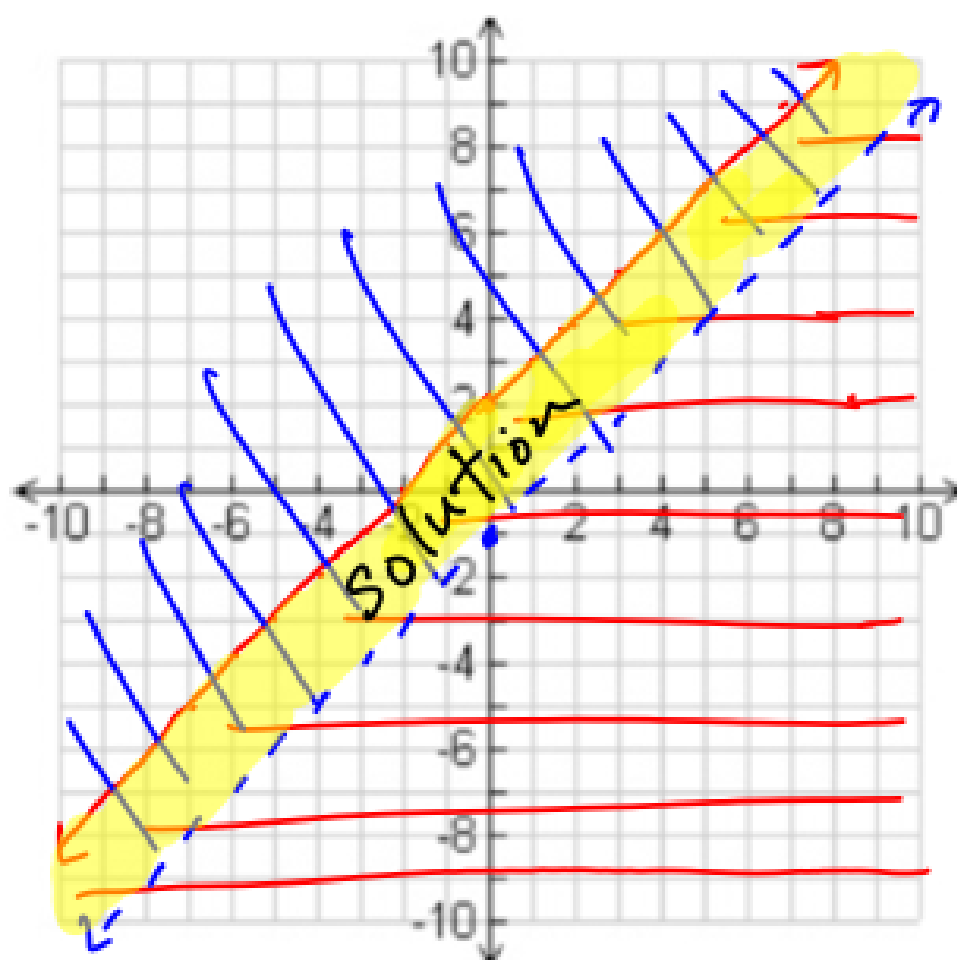
$$\text{Test } (0,0) : 0 \leq 0+2 \checkmark$$

$$\text{Test } (0,0) : 0 > 0-1 \checkmark$$

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

**Solution:** The overlap part!!



$$\text{Ex2)} \begin{cases} y > 3x & \leftarrow \text{---} \rightarrow \\ x - y > -2 & \leftarrow \text{---} \rightarrow \end{cases}$$

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

**Solution:** The overlap part!!

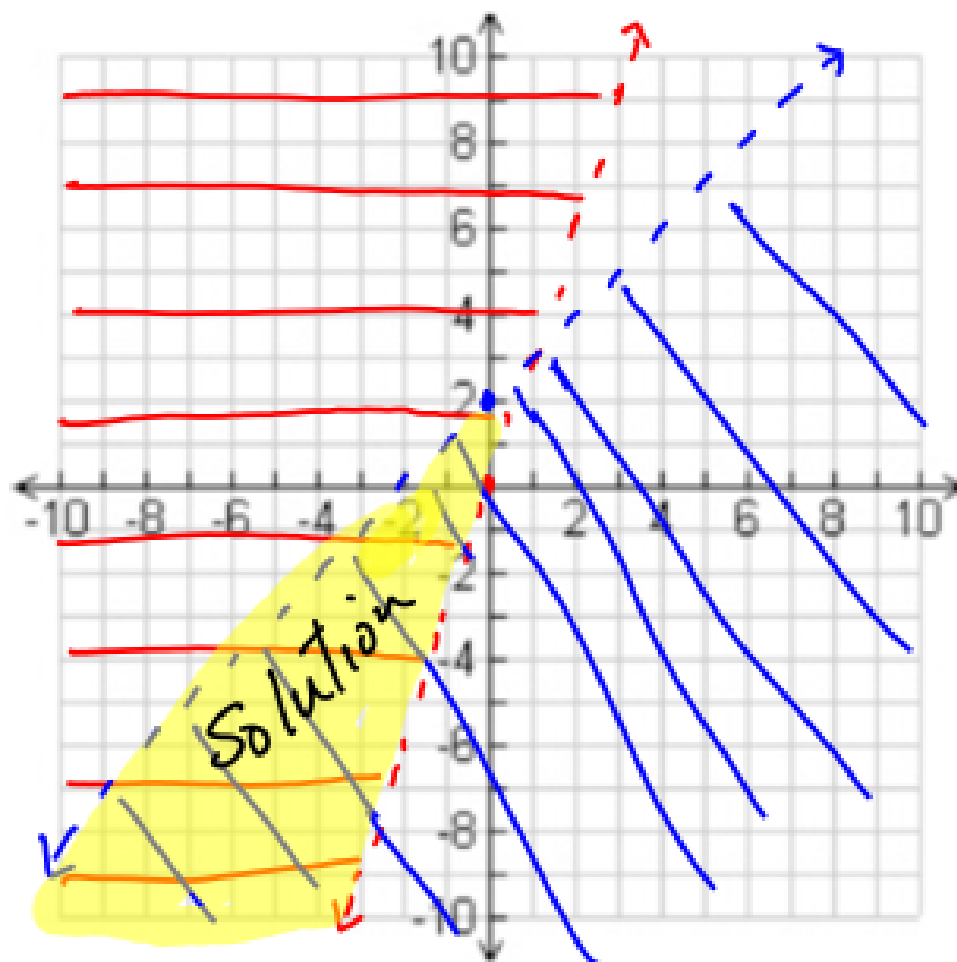
$$\text{Test } (1, 1) : 1 > 3(1) \times$$

$$x - y > -2$$

$$-y > -x - 2$$

$$y < x + 2$$

$$\text{Test } (0, 0) : 0 - 0 > -2 \checkmark$$



Try this) 
$$\begin{cases} 5x - y > 3 & \leftarrow \text{---} \text{---} \text{---} \text{---} \rightarrow \\ y \geq -x & \leftarrow \text{---} \text{---} \text{---} \rightarrow \end{cases}$$

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

**Solution:** The overlap part!!

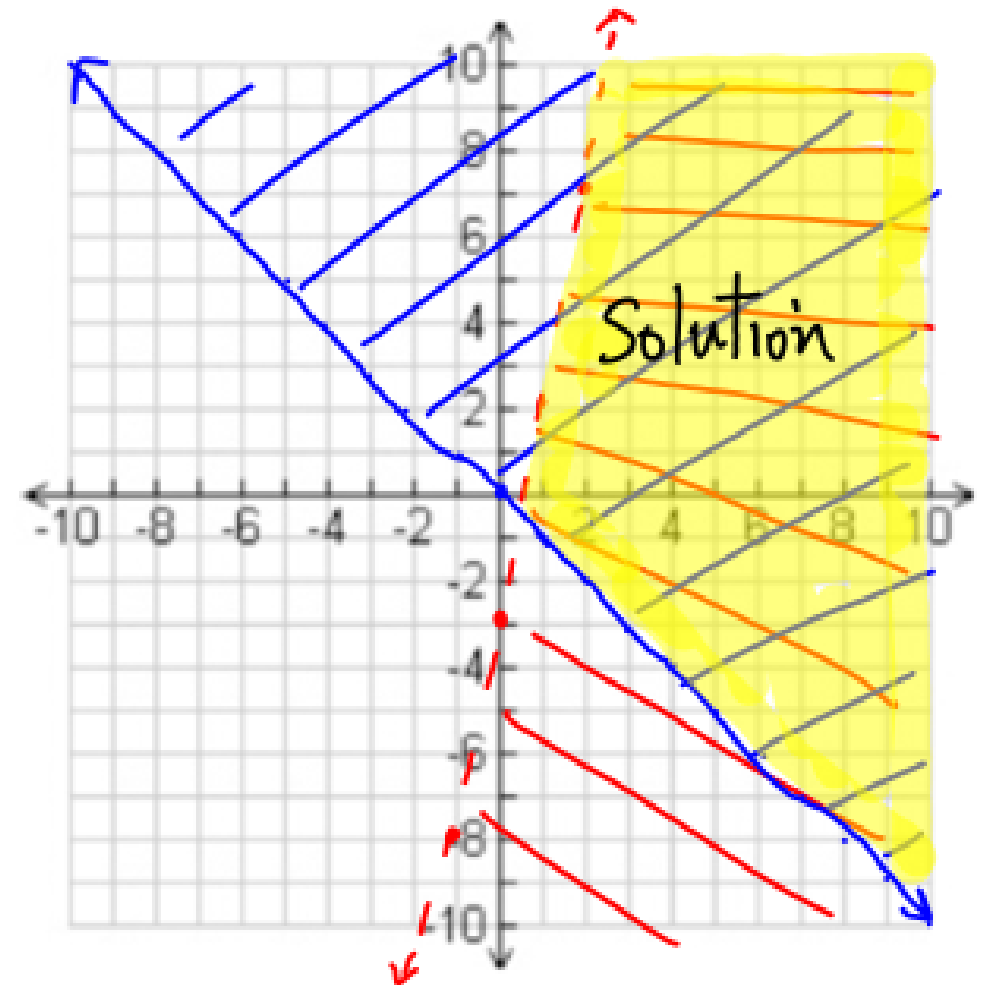
$$5x - y > 3$$

$$-y > -5x + 3$$

$$y < 5x - 3$$

Test (0,0) :  $0 > 3$  X

Test (1,1) :  $1 \geq -1$  ✓



$$\text{Ex3)} \begin{cases} y > 3x + 5 & \leftarrow \text{---} \rightarrow \\ y < 3x - 2 & \leftarrow \text{---} \rightarrow \end{cases}$$

$$\text{Test } (0,0) : 0 > 3(0) + 5 \quad \times$$

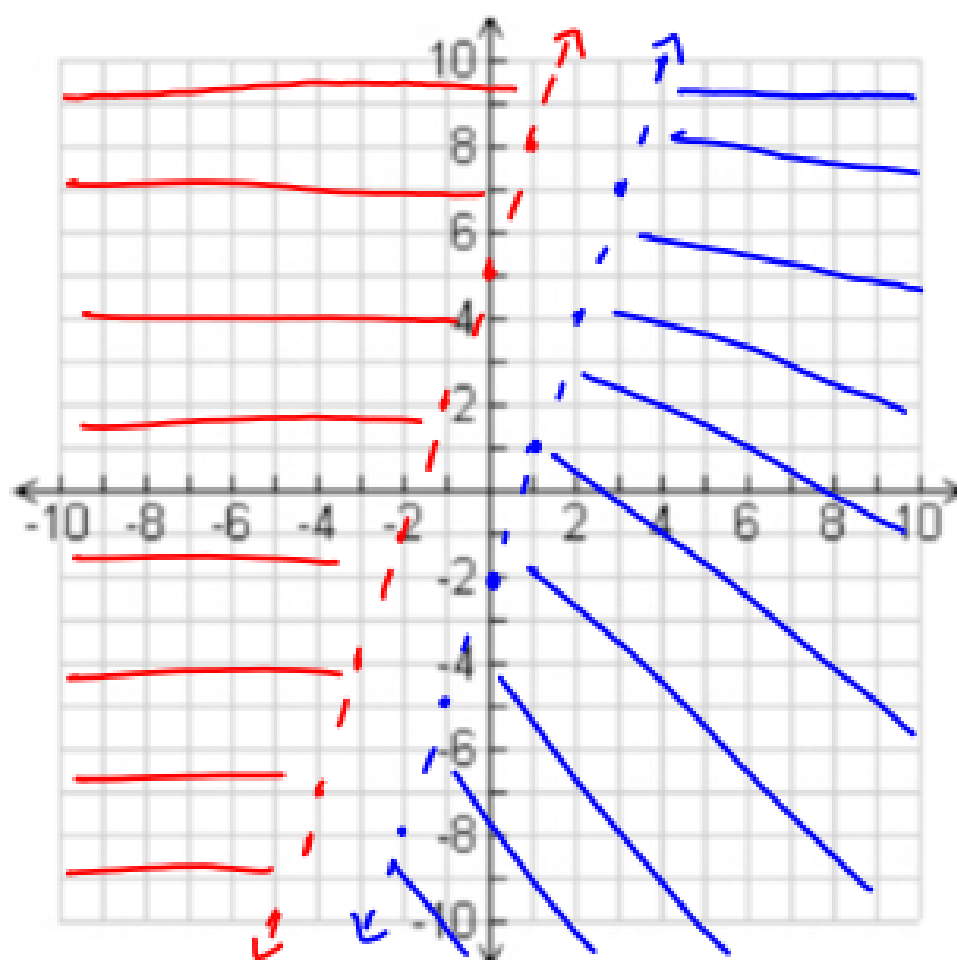
$$\text{Test } (0,0) : 0 < 3(0) - 2 \quad \times$$

No Solution !!

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

**Solution:** The overlap part!!



$$\text{Ex4)} \begin{cases} 2x + y \leq 1 & \longleftrightarrow \\ 2x + y > -4 & \leftarrow \text{---} \rightarrow \end{cases}$$

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

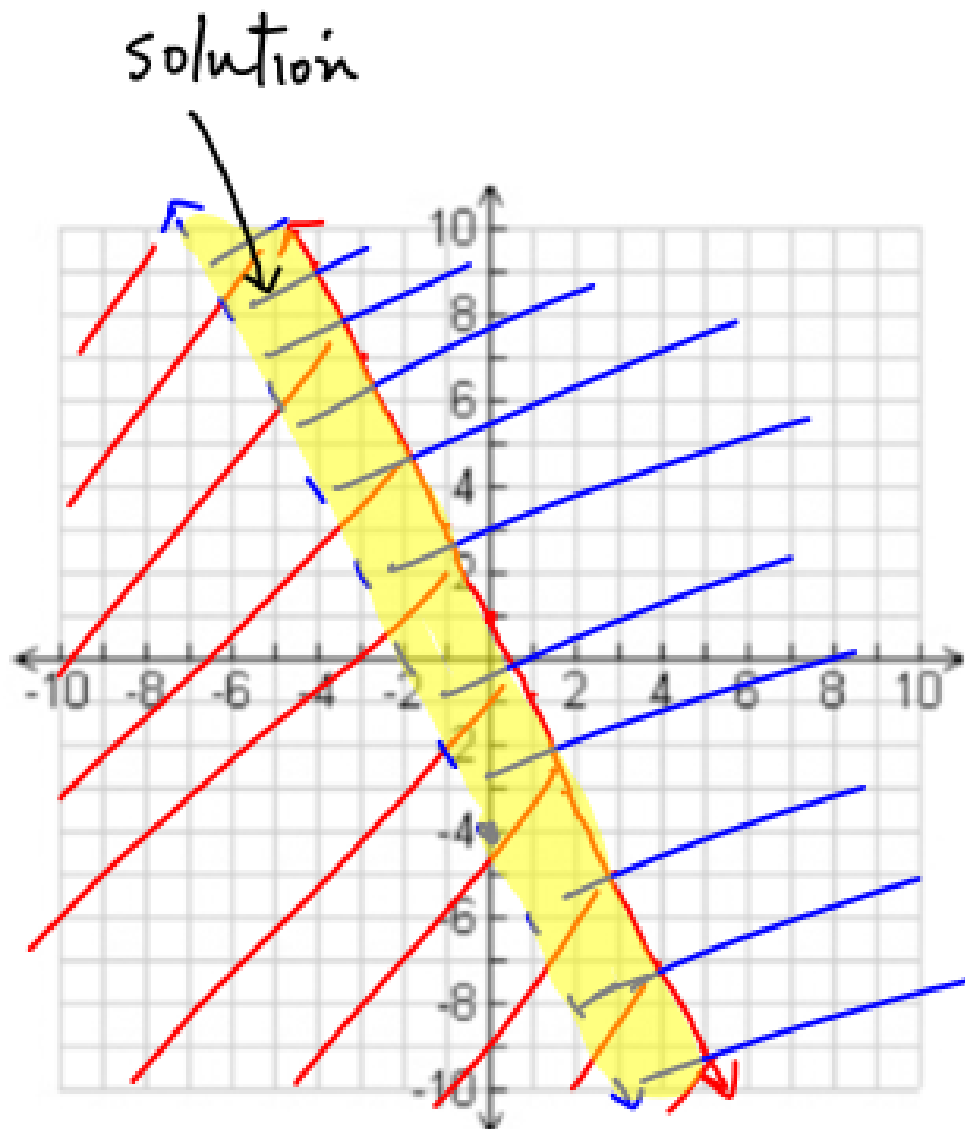
**Solution:** The overlap part!!

$$2x + y \leq 1$$

$$y \leq -2x + 1$$

$$2x + y > -4$$

$$y > -2x - 4$$



Try this)  $\begin{cases} 3x + 2y > 2 & \leftarrow \text{---} \rightarrow \\ 3x + 2y < -4 & \leftarrow \text{---} \rightarrow \end{cases}$

**Step 1:** Graph both equations

**Step 2:** Test and Shade the Region

**Solution:** The overlap part!!

$$3x + 2y > 2$$

$$2y > -3x + 2$$

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

$$3x + 2y < -4$$

$$2y < -3x - 4$$

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

No Solution

