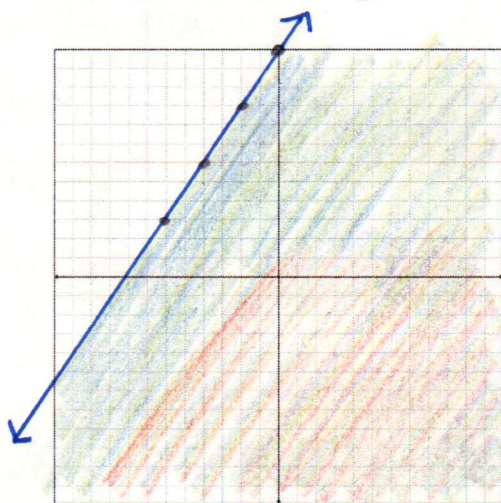


Notes 6.8 – Solving Systems of Inequalities

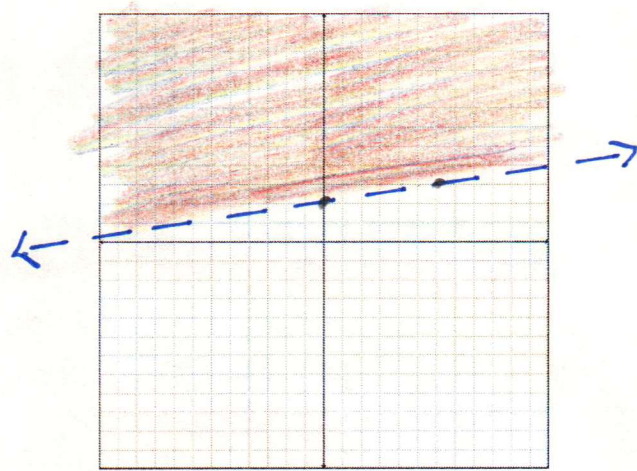
Warmup

Graph each inequality

a. $3x - 2y \geq -20$
 $\frac{3x - 2y \geq -20}{-2}$
 $\frac{-2y}{-2} \geq \frac{-3x - 20}{-2}$
 $y \leq \frac{3}{2}x + 10$



b. $x - 6y < -12$
 $\frac{x - 6y < -12}{-6}$
 $\frac{-6y}{-6} < \frac{-x - 12}{-6}$
 $y > \frac{1}{6}x + 2$



Which symbol gives a dashed line? > or <

How do you know where to shade? if $y <$ below
 if $y >$ above

Lesson

| Word | Meaning/Notation | Example |
|------------------------|---|---------|
| System of Inequalities | Two or more inequalities with the same variables graphed on the same coordinate graph. The solution is where the shaded parts overlap | |

$$1. \begin{cases} -5x + 3y \leq 45 \\ 2x + 3y > 24 \end{cases}$$

$$\begin{array}{r} -5x + 3y \leq 45 \\ +5x \qquad +5x \end{array}$$

$$\frac{3y}{3} \leq \frac{5x + 45}{3}$$

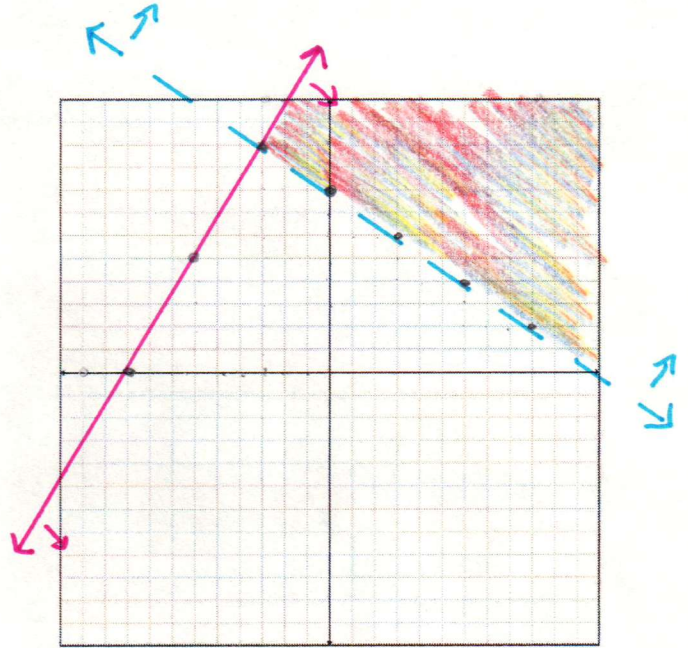
$$y \leq \frac{5}{3}x + 15$$

$$\begin{array}{r} 2x + 3y > 24 \\ -2x \qquad -2x \end{array}$$

$$\frac{3y}{3} > \frac{-2x + 24}{3}$$

$$y > -\frac{2}{3}x + 8$$

| x | y |
|----|----|
| -9 | 0 |
| -6 | 5 |
| -3 | 10 |



$$2. \begin{cases} 4x - 2y > 6 \\ 5x + 2y \leq 10 \end{cases}$$

$$\begin{array}{r} 4x - 2y > 6 \\ -4x \qquad -4x \end{array}$$

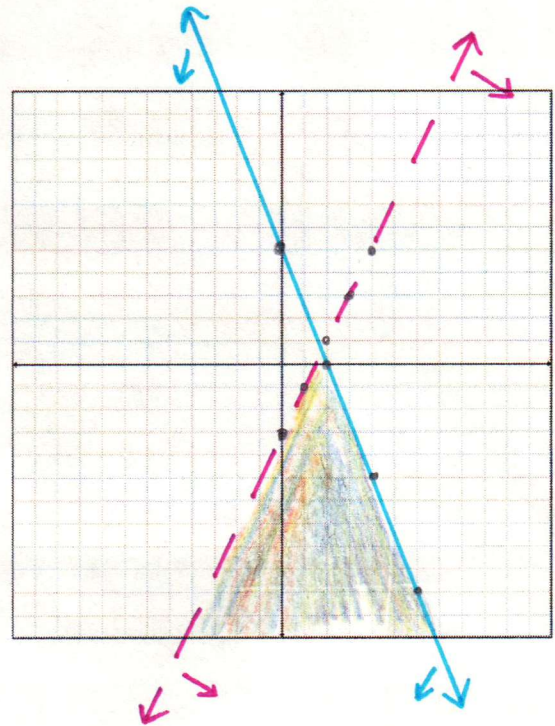
$$\frac{-2y}{-2} > \frac{-4x + 6}{-2}$$

$$y < 2x - 3$$

$$\begin{array}{r} 5x + 2y \leq 10 \\ -5x \qquad -5x \end{array}$$

$$\frac{2y}{2} \leq \frac{-5x + 10}{2}$$

$$y \leq -\frac{5}{2}x + 5$$



$$3. \begin{cases} 2x - 3y < 6 \\ 3x + 2y > -6 \\ x + 3y \leq 9 \end{cases}$$

$$2x - 3y < 6$$

$$\begin{array}{r} -2x \\ -2x \end{array}$$

$$\frac{-3y}{-3} < \frac{-2x + 6}{-3} \frac{6}{-3}$$

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

$$3x + 2y > -6$$

$$\begin{array}{r} -3x \\ -3x \end{array}$$

$$\frac{2y}{2} > \frac{-3x - 6}{2} \frac{-6}{2}$$

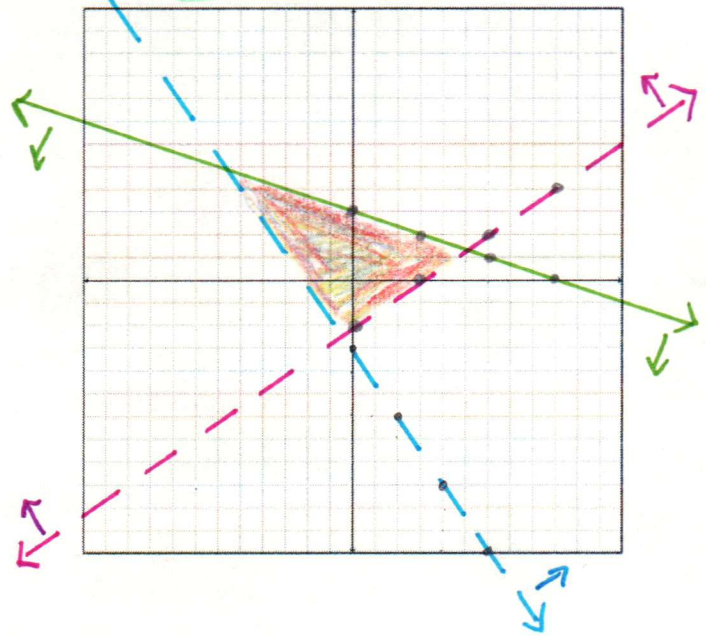
$$y > -\frac{3}{2}x - 3$$

$$x + 3y \leq 9$$

$$\begin{array}{r} -x \\ -x \end{array}$$

$$\frac{3y}{3} \leq \frac{-x + 9}{3} \frac{9}{3}$$

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



4. Look at the given graph for a system of equations. Where is the solution?

There is no solution because there is no place where all 3 shaded areas overlap.

