

Solving Systems of Linear Inequalities

Definitions: Two or more linear inequalities form a system of linear inequalities.

The graph of a system of linear inequalities is the graph of all solutions to the system.

To solve: Graph both inequalities and the solutions of the system of linear inequalities is the overlap or intersection of the shaded regions. This area represents the solution to the entire system.

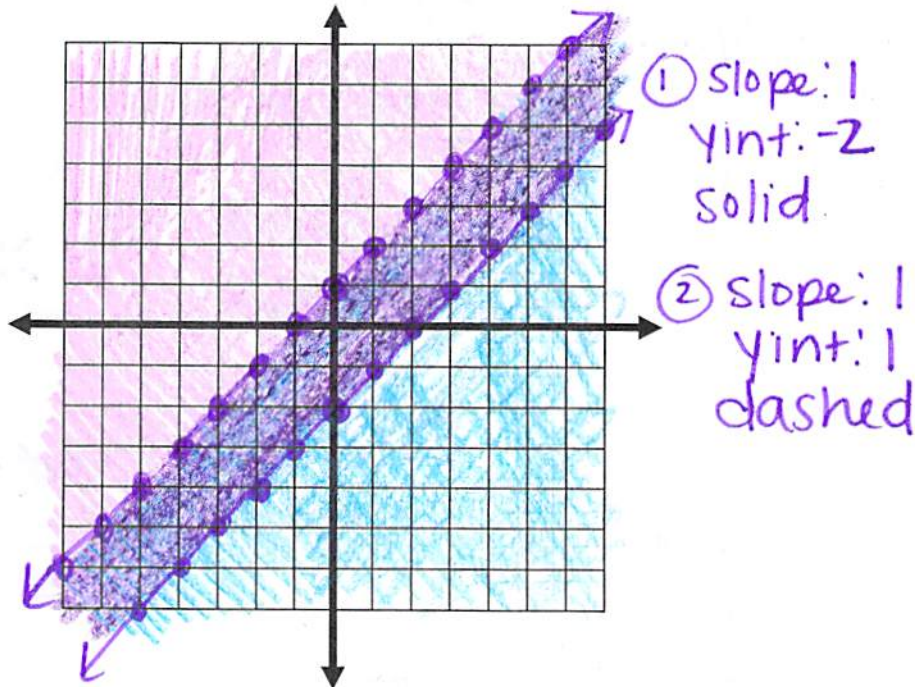
Example:

I. Graph the system of linear inequalities.

1.

$$y \geq x - 2$$

$$y < x + 1$$

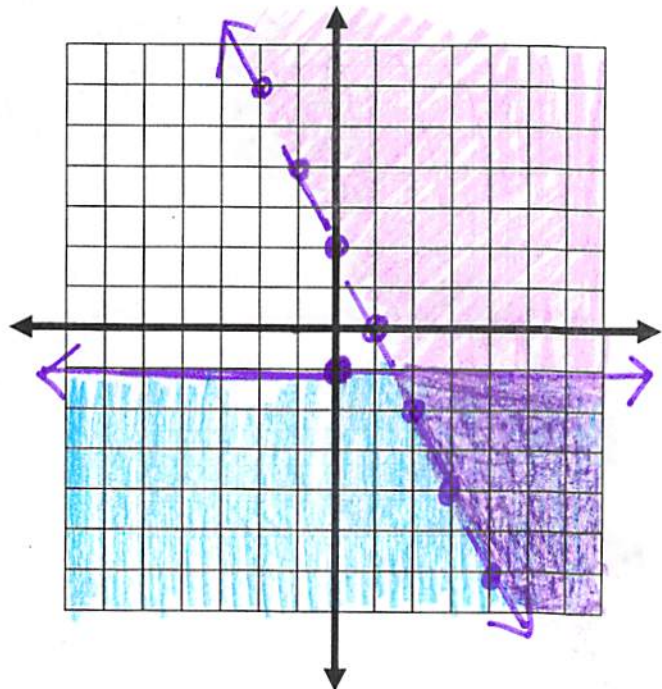


2. $y > -2x + 2$

$$y \leq -1$$

① slope: -2
yint: 2
dashed

② horizontal
line at $y = -1$
Solid.



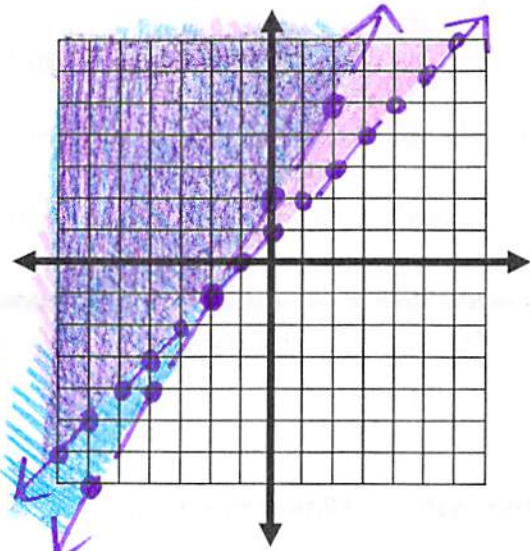
3. $1 - y < -x$
 $2y - 3x > 4$

$$\begin{array}{r} y - y < -x \\ -1 \quad -1 \\ \hline -y < -x - 1 \\ -1 \quad -1 \quad = \\ \hline y > x + 1 \end{array}$$

slope: 1
 yint: 1
 dashed

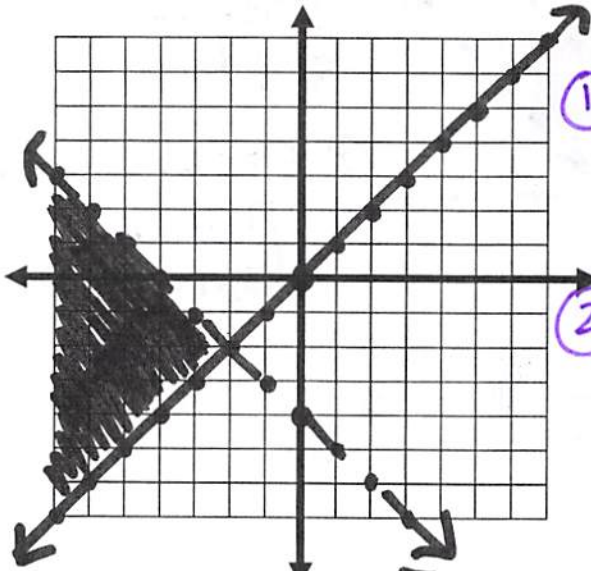
$$\begin{array}{r} 2y - 3x > 4 \\ +3x \quad +3x \\ \hline 2y > 3x + 4 \\ \frac{2}{2} \quad \frac{3}{2} \quad \frac{4}{2} \\ \hline y > \frac{3}{2}x + 2 \end{array}$$

slope: $\frac{3}{2}$ dashed
 yint: 2



II. Write a system of linear inequalities that defines the shaded region.

1.



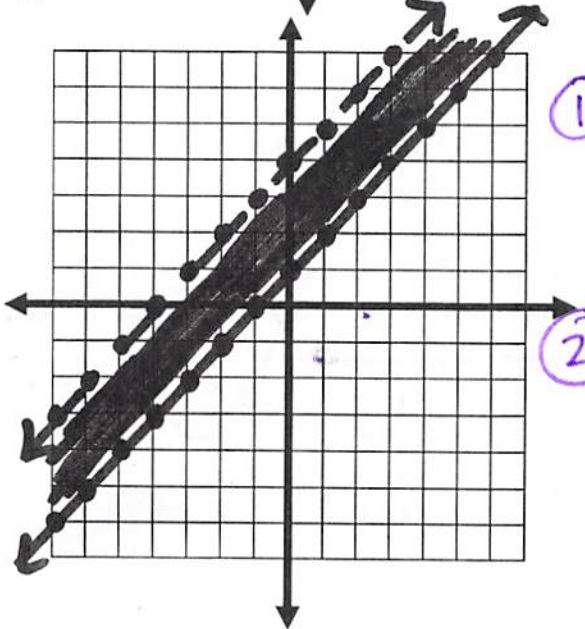
① yint: 0
 slope: 1

$$y \geq x$$

② yint: -4
 slope: -1

$$y < -x - 4$$

2.



① slope: 1
 yint: 1

$$y \geq x + 1$$

② slope: 1
 yint: 4

$$y < x + 4$$