

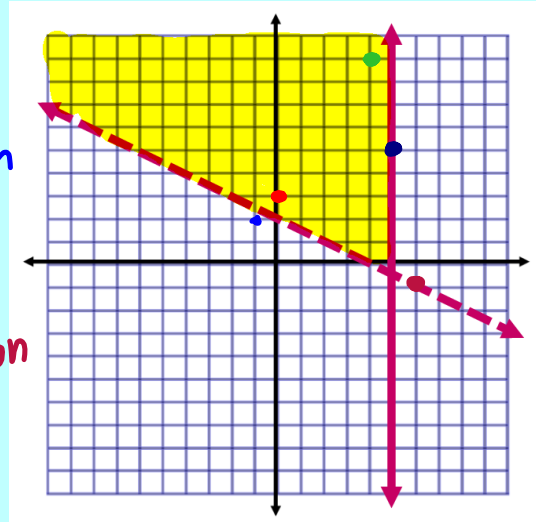
6.6 Systems of Linear Inequalities

- A collection of linear inequalities in the same variables
- The solution is **any** ordered pair that satisfies **each** of the inequalities of the system
- The graph of a system is the graph of **all** solutions of the system

Example 1

Tell whether the ordered pair is a solution.

- a) $(-1, 2)$ not a solution
 b) $(0, 3)$ solution
 c) $(4, 9)$ solution
 d) $(5, 5)$ solution
 e) $(6, -1)$ not a solution



Example 2

Graph the system.

$$y \geq -3x - 1$$

$$y < x + 2$$

$$y \geq -3x - 1 \quad y < x + 2$$

$$m = -3$$

$$m = 1$$

$$y\text{-int} = -1$$

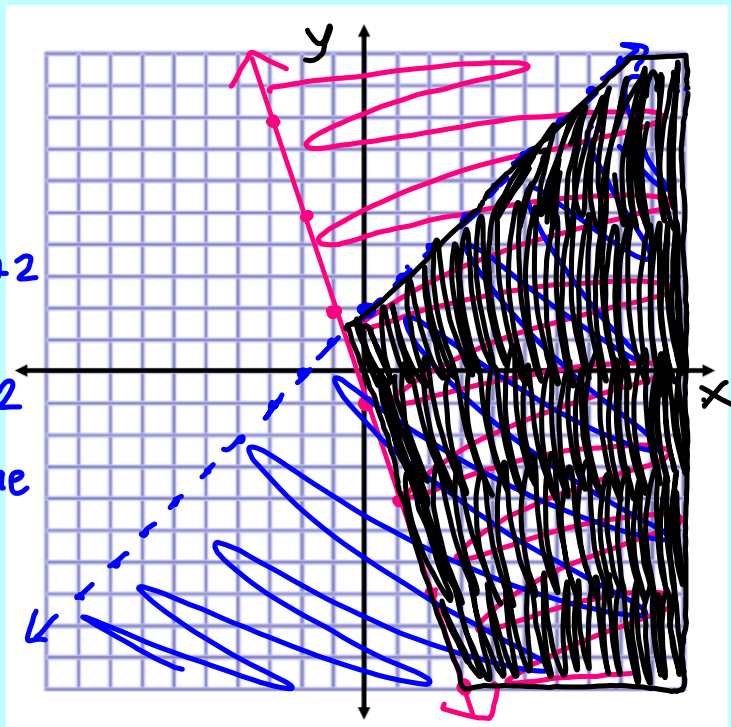
$$y\text{-int} = 2$$

Solid line

dotted line

shade
above
y-int

shade
below
y-int



Example 3

Graph the system.

$$x - 2y \leq 3$$

$$y > 3x - 4$$

$$\begin{array}{r} x - 2y \leq 3 \\ -x \quad -x \\ \hline -2y \leq -x + 3 \\ -2 \quad -2 \quad -2 \\ \hline y \geq \frac{1}{2}x - \frac{3}{2} \end{array}$$

$$m = \frac{1}{2}$$

$$y = -\frac{3}{2}(-1.5)$$

Solid line

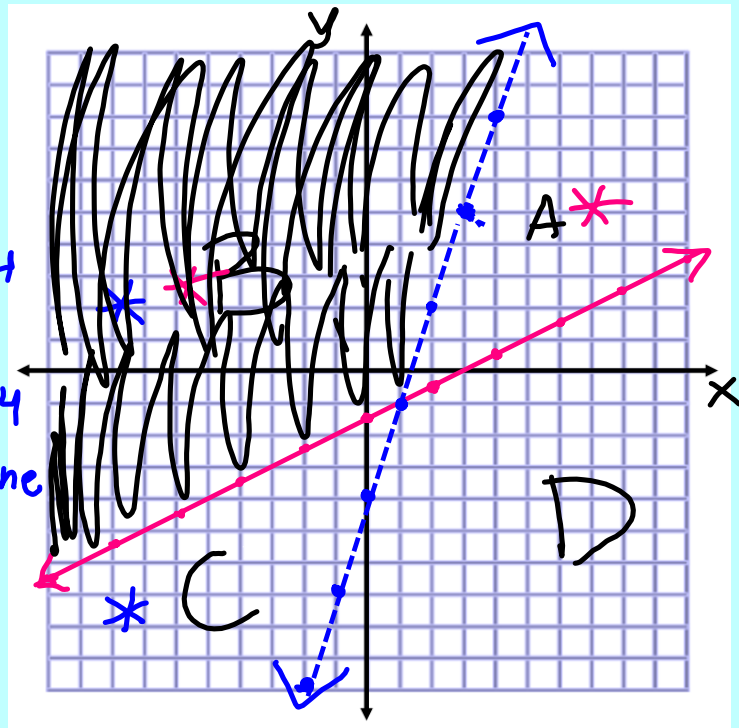
Shade
above
y-int

$$y > 3x - 4$$

$$m = 3$$

$$y\text{-int} = -4$$

dotted line

Shade
above
y-intExample 4

Graph the system.

$$x + y \geq 5$$

$$x + y < 1$$

$$\begin{array}{r} x + y \geq 5 \\ -x \quad -x \\ \hline y \geq -x + 5 \end{array}$$

$$m = -1$$

$$y\text{-int} = 5$$

Solid

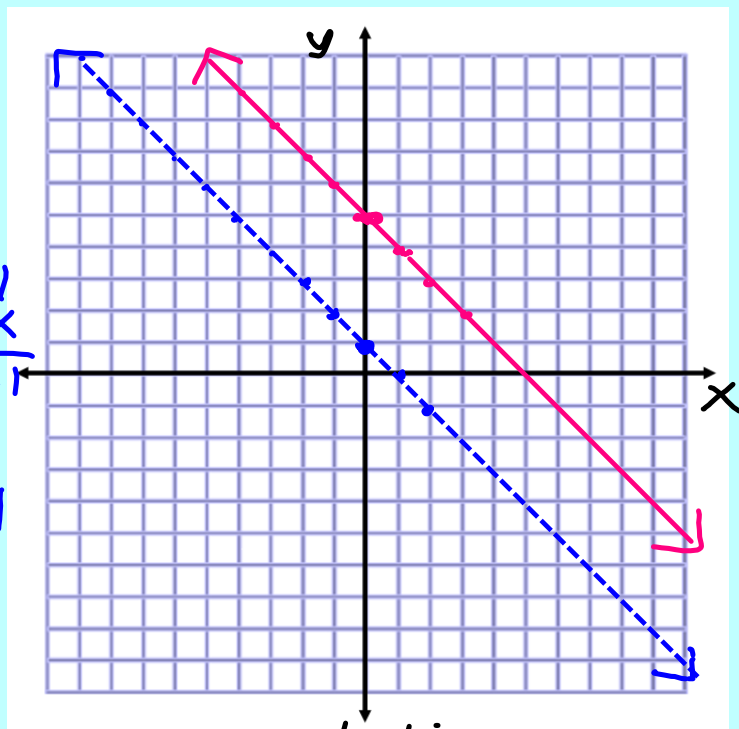
Shade
above
y-int

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

$$m = -1$$

$$y\text{-int} = 1$$

dotted

Shade
below
y-int

no solution

Example 5

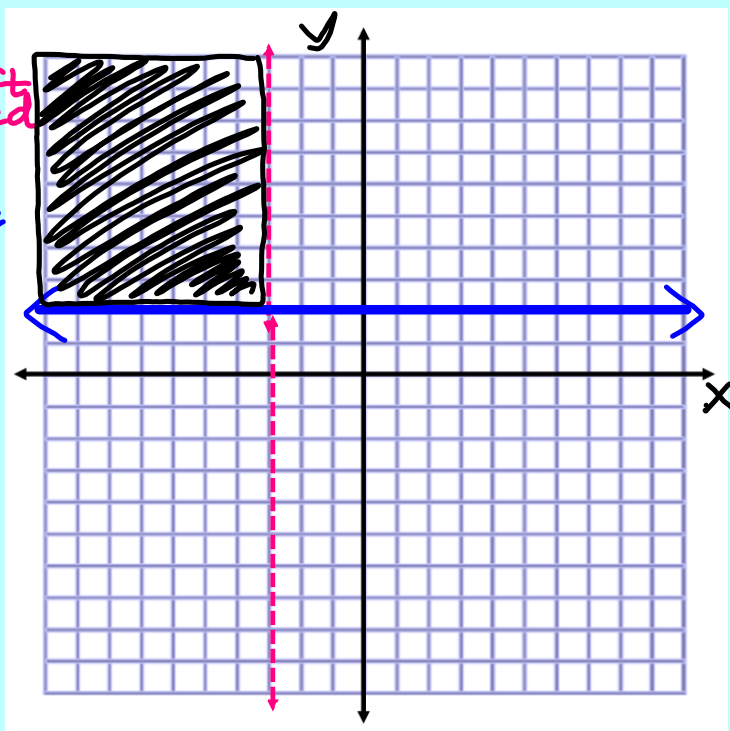
Graph the system.

$$x < -3$$

shade left
vert. dotted

$$y \geq 2$$

hor. solid
shade above

Example 6

Graph the system.

$$x < 5$$

left

$$x \geq -4$$

right

