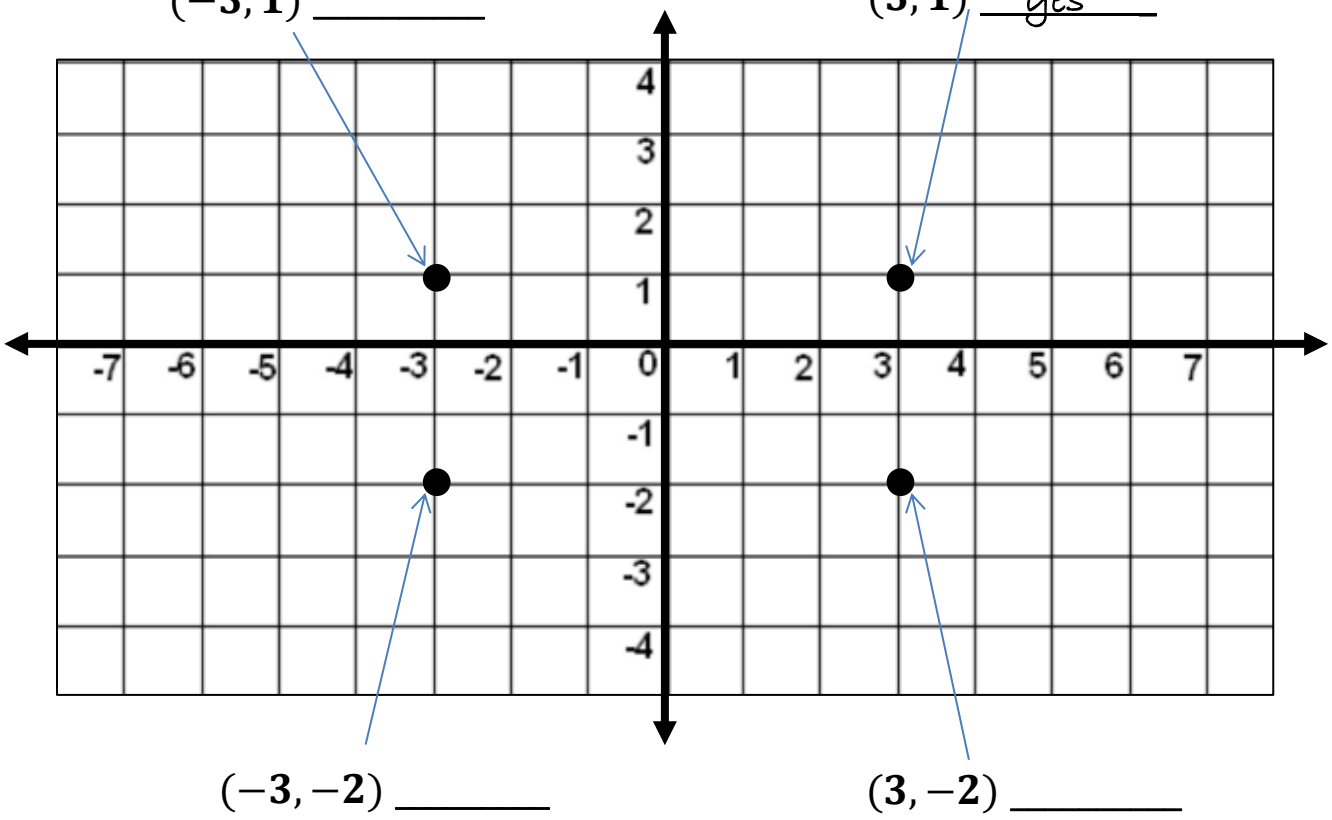
Introduction to Linear Inequalities

Example 1

$$x + y > 0$$

We are looking for all the points (ordered pairs) that satisfy the inequality.

Consider the points below: (Fill in yes or no)



$(3, 1)$ satisfies the inequality since $3 + 1 = 4 > 0$

What about the other points?

We can't test every point to see if it satisfies the inequality, so we have a process to find all solutions.

Step 1: Graph the boundary line for the inequality.
We do this by making the inequality into an equality

$$x + y > 0 \longrightarrow x + y = 0$$

To graph the line, we make a chart

x	y
-2	**2**
-1	**1**
0	**0**

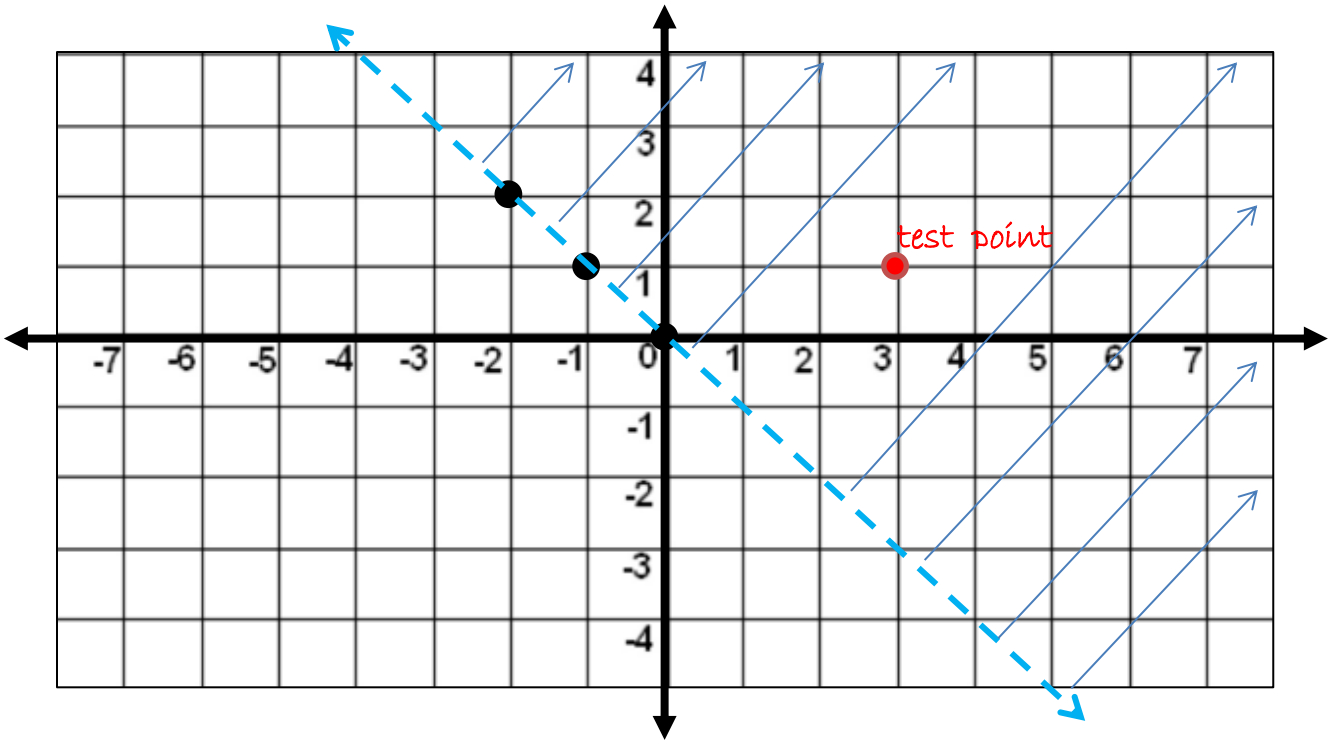
We plot the points to draw the line.

NOTE: The boundary line is drawn as a **dashed line** whenever you have a strict inequality

$$< \textbf{\textit{or}} >$$

and is drawn as a **solid line** whenever you have

$$\leq \textbf{\textit{or}} \geq$$



Step 2: Choose a point not on the boundary line and check to see if it satisfies the inequality.

~If yes, then shade the region that <u>INCLUDES</u> the test point.

~ If no, then shade the region that <u>DOES NOT INCLUDE</u> the test point.

We know the point $(3, 1)$ satisfies the equation so we shade the region that includes the point $(3, 1)$.

Introduction to Linear Inequalities

Practice Problems

Graph the inequality

$$x - y < 1$$