

## Algebra 2

### Review: Graphing Linear Inequalities

This worksheet is meant to give you a review of how to graph linear inequalities.

#### Graphing Linear Inequalities:

**1. Decide if the line will be solid or dotted.**

The line will be solid when the inequality includes  $\leq$  or  $\geq$ . The solid line indicates that all points on the line are included in the solution set.

The line will be dotted (or dashed) when the inequality includes  $<$  or  $>$ . The dotted line indicates that all points on the line are NOT included in the solution set.

**2. Graph the appropriate line.**

Slope-Intercept  
x- and y-intercepts

**3. Choose a point on either side of the line and test with the given inequality.**

Substitute the points into the inequality to see which is true.

**4. Shade on the appropriate side of the line.**

Shade on the side which contains the point which made the inequality true.

**Example 1:**  $y \geq \frac{2}{3}x - 3$

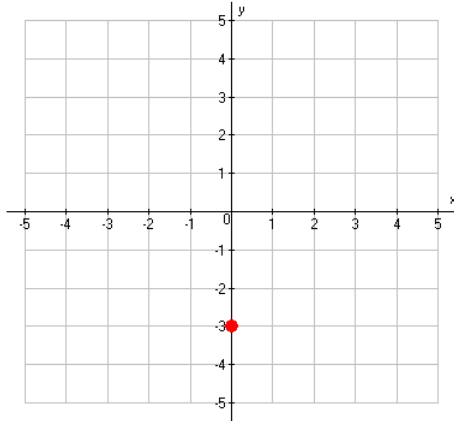
**1. Decide if the line will be solid or dotted.**

This line will be **solid** because the inequality includes  $\geq$ .

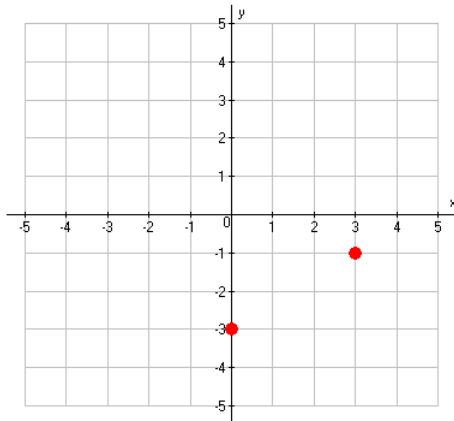
2. Graph the appropriate line.

This line is written in **Slope-Intercept Form**. The slope is  $\frac{2}{3}$ . The y-intercept is -3.

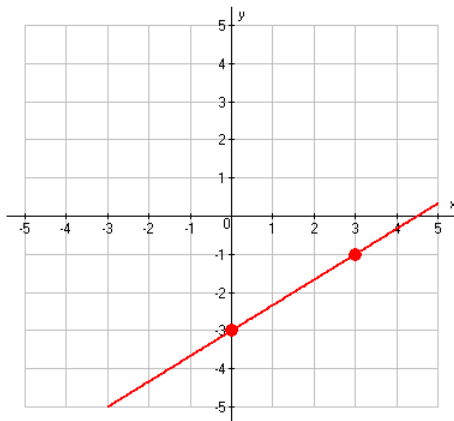
Since the y-intercept is -3, first graph -3 on the y-axis.



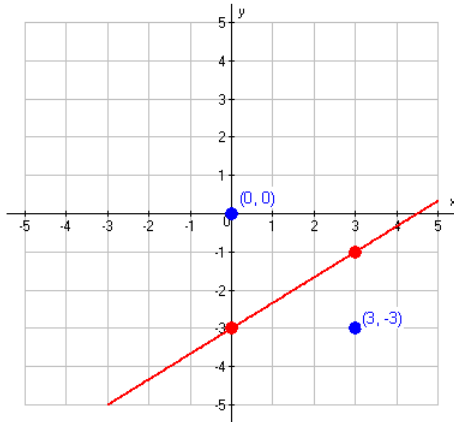
Since the slope is  $\frac{2}{3}$ , move up two units and to the right 3 units. Plot a second point.



Draw a line through these two points (in this case- solid).



3. Choose a point on either side of the line and test with the given inequality.



Substitute the points into the inequality to see which is true.

$$(0, 0): y \geq \frac{2}{3}x - 3$$

$$(0) \geq \frac{2}{3}(0) - 3$$

$$0 \geq 0 - 3$$

$$0 \geq -3$$

true!!

$$(3, -3): y \geq \frac{2}{3}x - 3$$

$$(-3) \geq \frac{2}{3}(3) - 3$$

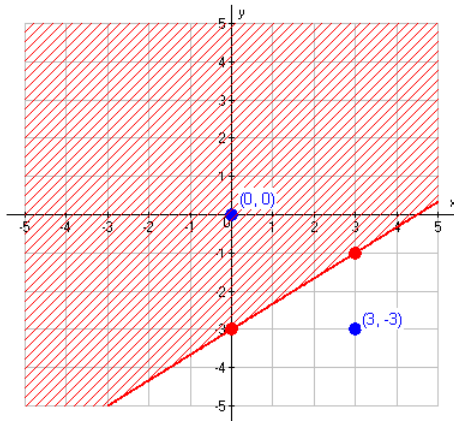
$$-3 \geq 2 - 3$$

$$-3 \geq -1$$

false!!

4. Shade on the appropriate side of the line.

Shade on the side which contains the point which made the inequality true.



**Example 2:**  $3x - 4y > 24$

**1. Decide if the line will be solid or dotted.**

This line will be **dotted** because the inequality includes  $>$ .

**2. Graph the appropriate line.**

This line is written in the form to easily find the **x- and y-intercepts**.

To find the y-intercept, set  $x = 0$  and solve for y. (Use '='.)

$$3x - 4y = 24$$

$$3(0) - 4y = 24$$

$$0 - 4y = 24$$

$$-4y = 24$$

$$y = -6$$

This gives the point (0, -6).

To find the x-intercept, set  $y = 0$  and solve for x. (Use '='.)

$$3x - 4y = 24$$

$$3x - 4(0) = 24$$

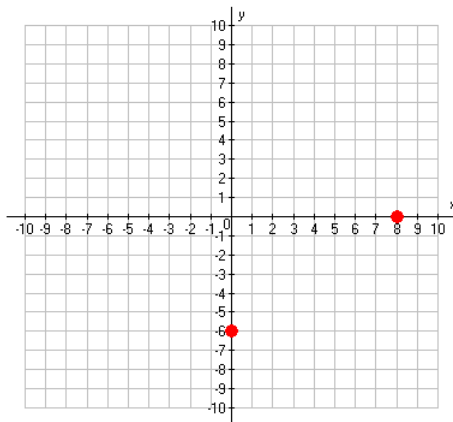
$$3x - 0 = 24$$

$$3x = 24$$

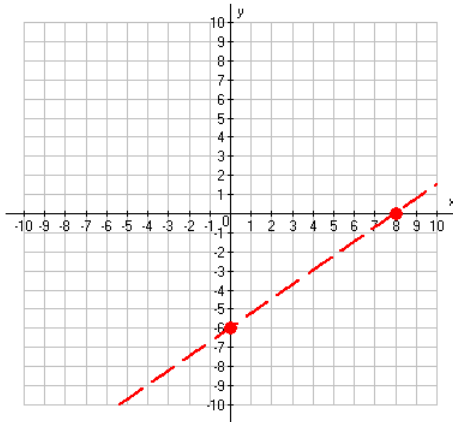
$$x = 8$$

This gives the point (8, 0).

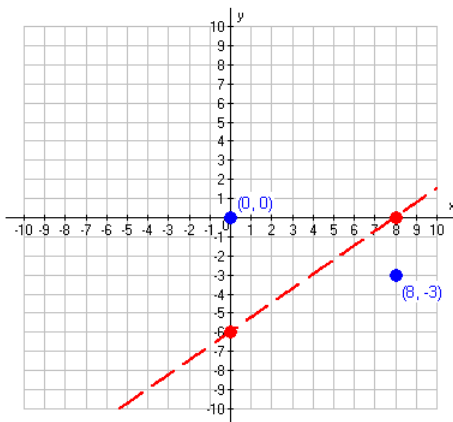
Graph these intercepts.



Draw a line through these two points (in this case- dotted).



3. Choose a point on either side of the line and test with the given inequality.



Substitute the points into the inequality to see which is true.

$(0, 0): 3x - 4y > 24$

$$3(0) - 4(0) > 24$$

$$0 - 0 > 24$$

$$0 > 24$$

false!!

$(8, -3): 3x - 4y > 24$

$$3(8) - 4(-3) > 24$$

$$24 + 12 > 24$$

$$36 > 24$$

true!!

4. **Shade on the appropriate side of the line.**

Shade on the side which contains the point which made the inequality true.

