

7.2 - Graphing Linear Inequalities

To determine if a point is a solution of a linear inequality, plug the point in to the equation. If the resulting inequality is true, then the point is a solution.

Check whether the ordered pairs are solutions of $3x + 2y \geq 2$.

A. $(0, 0)$ - No

B. $(2, -1)$ - Yes

C. $(-2, 4)$ - Yes

$$3(0) + 2(0) \geq 2$$

$$0 \geq 2$$

False

$$3(2) + 2(-1) \geq 2$$

$$6 - 2 \geq 2$$

$$4 \geq 2$$

True

$$3(-2) + 2(4) \geq 2$$

$$-6 + 8 \geq 2$$

$$2 \geq 2$$

True

To sketch the graph of a linear inequality:

- Solve the inequality for y and graph the corresponding linear equation. For a $<$ or $>$ statement, the corresponding line **is not** a part of the solution so it should be **dashed**. For a \leq or \geq statement, the corresponding line **is** a part of the solution so it should be **solid**.
- Test a point to see if it is a solution of the inequality.
- Show the solution to the inequality by shading the side of the line that contains the points that satisfy the inequality. If your test point was a solution, shade on that side. If it was not, shade on the other side.

Sketch the graph of the following linear inequalities.

1. $y > -2x + 6$

Graph $y = -2x + 6$.

$$m = -2$$

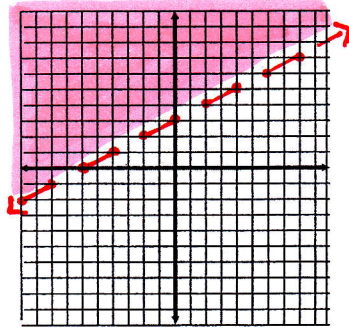
$$b = 6$$

Try $(0, 0)$.

$$0 > -2(0) + 6$$

$$0 > 6$$

False



2. $3x - 2y > 8$

Graph $3x - 2y = 8$.

$$-2y = -3x + 8$$

$$y = \frac{3}{2}x - 4$$

$$m = \frac{3}{2}$$

$$b = -4$$

Try $(0, 0)$.

$$3(0) - 2(0) > 8$$

$$0 > 8$$

False

3. $2x - 3y \geq -6$

Graph $2x - 3y = -6$.

$$-3y = -2x - 6$$

$$y = \frac{2}{3}x + 2$$

$$m = \frac{2}{3}$$

$$b = 2$$

Try $(0, 0)$.

$$2(0) - 3(0) \geq -6$$

$$0 \geq -6$$

True

4. $x \geq -3$

Graph $x = -3$.

Try $(0, 0)$.

$$0 \geq -3$$

True

