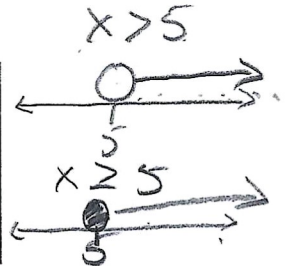


How do we graph a Linear Inequality in Two Variables?

Procedure:

- 1) Make sure the inequality is similar in form to $y = mx + b$ (slope-intercept)
- 2) Plot the points representing the graph of the inequality as if it was an equation.
- 3) After plotting the points you must connect them.

- If the inequality is $<$ or $>$ connect the points with a **dotted line**.
- If the inequality is \leq or \geq connect the points with a **solid line**.



- 4) Finally, you must **shade** the area representing the solution set of the inequality.

- If the inequality is $>$ or \geq **shade above** the line. *Test point*
- If the inequality is $<$ or \leq **shade below** the line. *Test point*

** You can also use a test point to check if you shaded in the correct direction!

You can't use a point on the line. it must be in the shaded region

- 1) Graph the inequality:

$$y - 2x \geq 2$$

$$\frac{+2x}{+2x} \quad \frac{+2x}{+2x}$$

$$y \geq 2x + 2$$

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

$$b = 2$$

• solid

• shade above the y-int.

Test Point

$$(-3, 5)$$

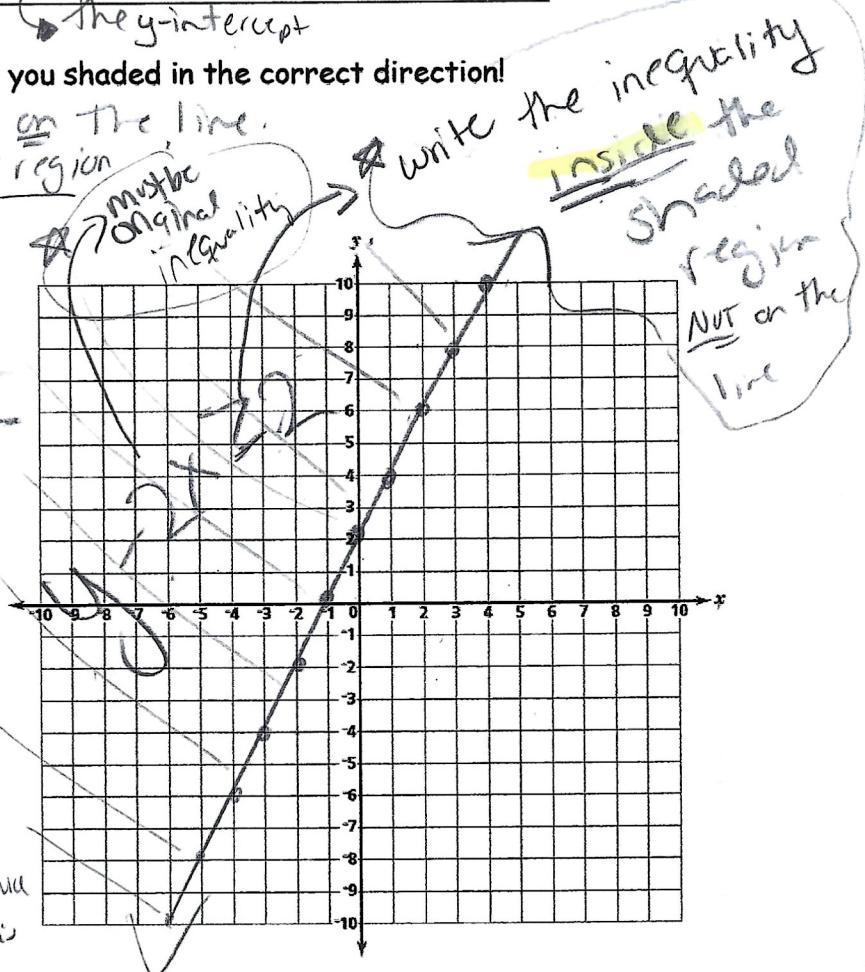
$$y - 2x \geq 2$$

$$5 - 2(-3) \geq 2$$

$$5 + 6 \geq 2$$

$$11 \geq 2$$

means you should have shading where this point is



2) Graph the inequality:

$$2x - 3y < 9$$

$$\frac{-3y < -2x + 9}{-3}$$

$$y \geq \frac{2}{3}x - 3$$

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

$$B = -3$$

Just this version to tell shade above/below the y-int

when you divide (or mult) by a negative #. in inequalities you must switch the direction of the inequality symbol

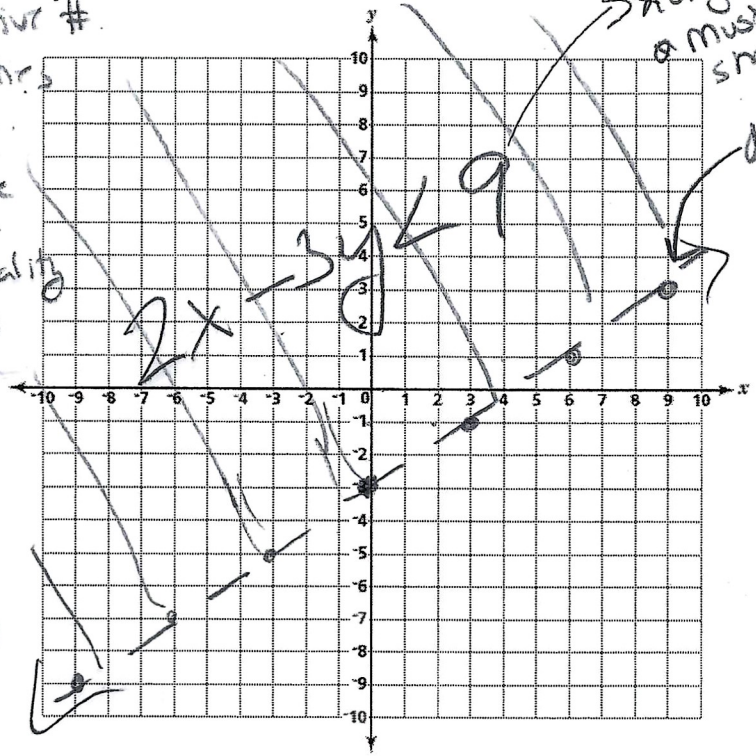
Test point

$$(0,0)$$

$$2x - 3y < 9$$

$$2(0) - 3(0) < 9$$

$$0 < 9$$



3) Graph the inequality:

$$y < 0x + 2$$

$$y < 2$$

$$m = 0$$

$$B = 2$$

dotted
shade below y-int

Test point

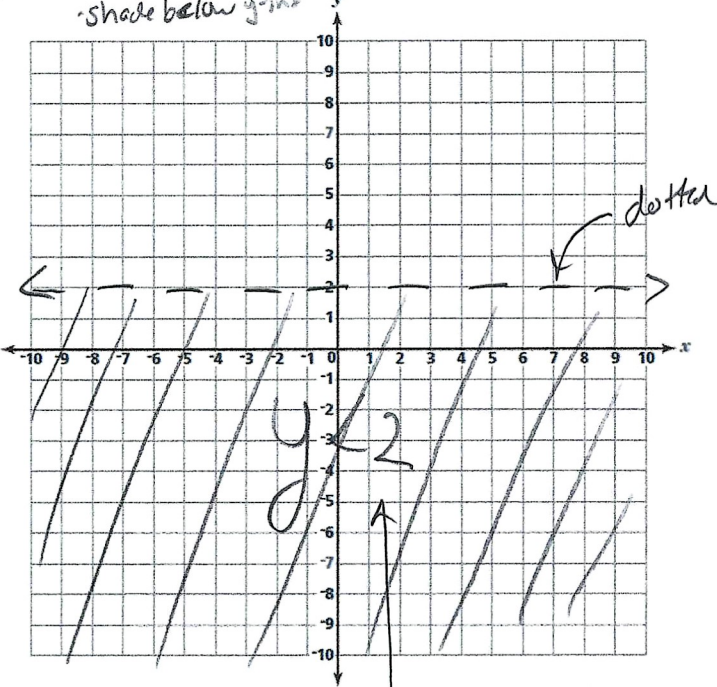
$$(0,0)$$

$$y < 2$$

$$0 < 2$$

$$✓$$

y = # horizontal line



4) Graph the inequality:

x = # vertical line

$$x > 3$$

$$m = \text{undefined}$$

$$B = \text{No y-int}$$

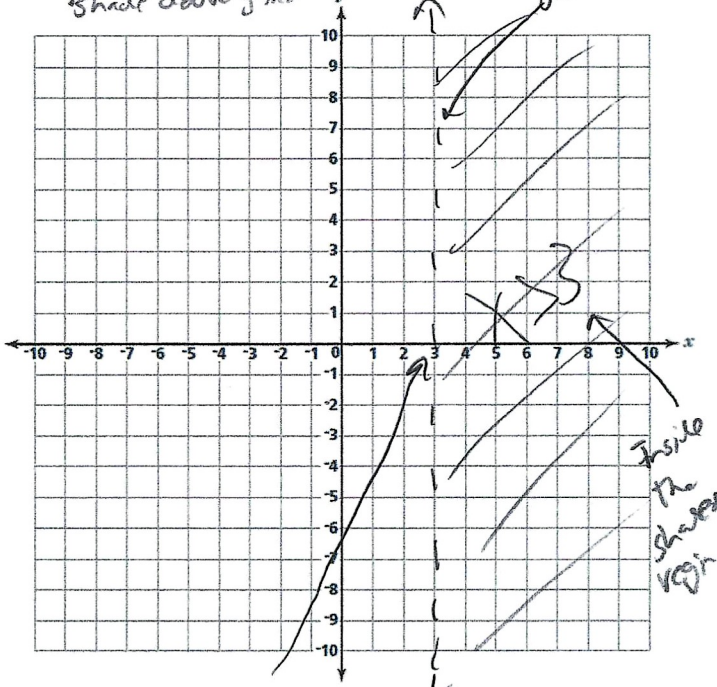
dotted
shade above y-int

Test point

$$(5,1)$$

$$x > 3$$

$$5 > 3$$



** you start graphing on the x-axis when it is x = # (NOT the y-axis) it's the x-intercept