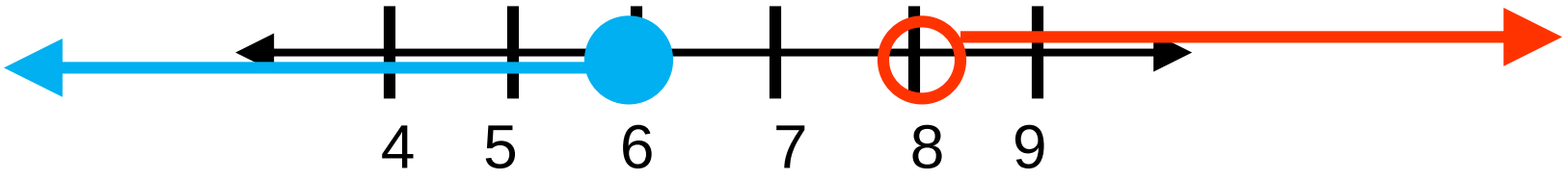
Math-2A
Lesson 6-6

Two Variable Linear Inequalities

Graph the solution to the compound inequality:

$x \leq 6$ or $x > 8$

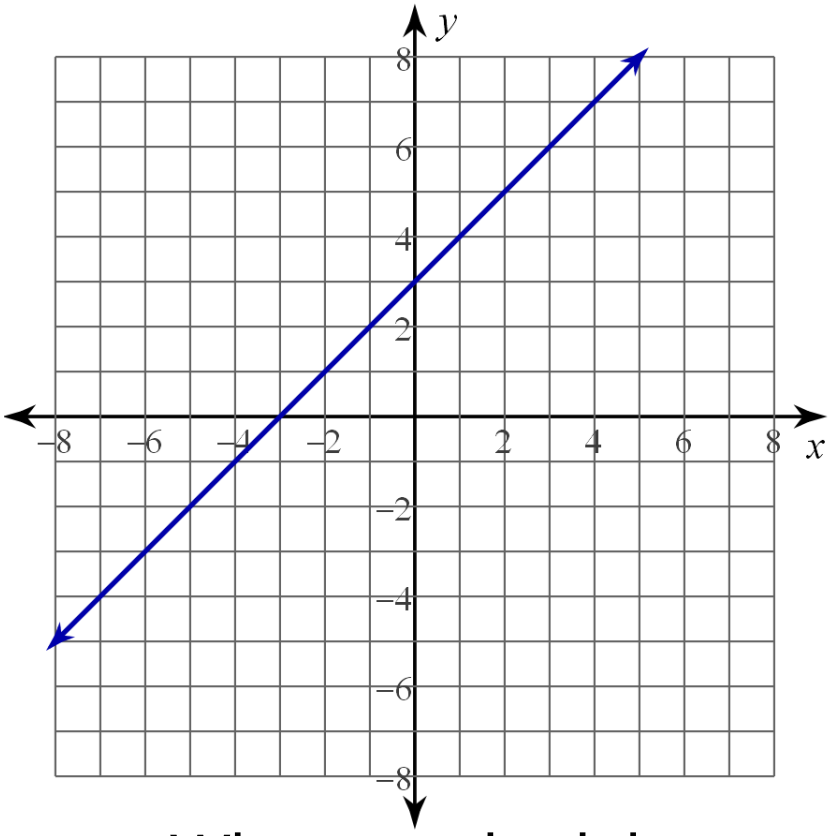


How would you define (in words) what a solution to a single variable compound inequality means?

The values of ‘x’ that make the inequality true.

Draw the graph of the following:

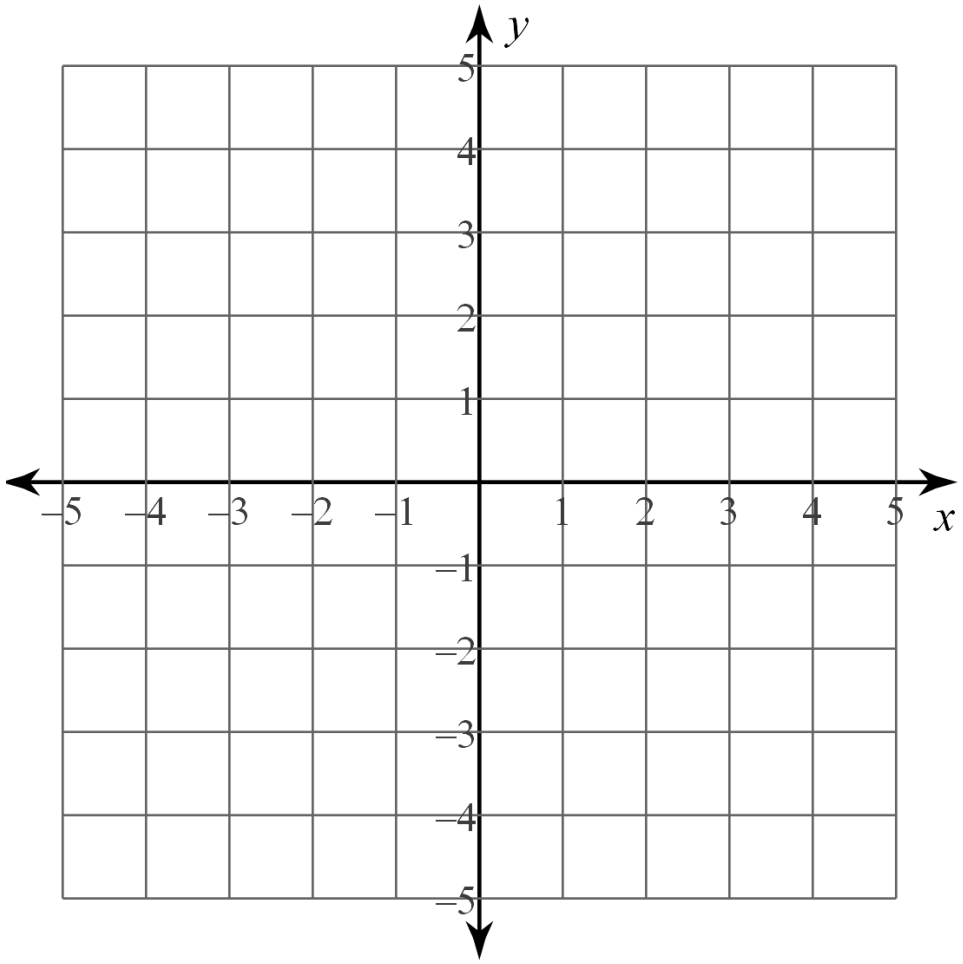
$$y = x + 3$$



What is the solution to a two-variable equation: y = x + 3 ?

The x-y pairs that make the equation true. When graphed the solution to the equation is ALL of the points on the graph of the equation.

$$y \geq x + 3$$



What is the solution to a two-variable inequality $y \geq x + 3$?

The x-y pairs that make the inequality true. When graphed the solution to the equation is ALL of the points on the graph of the inequality.

$$y \geq x + 3$$

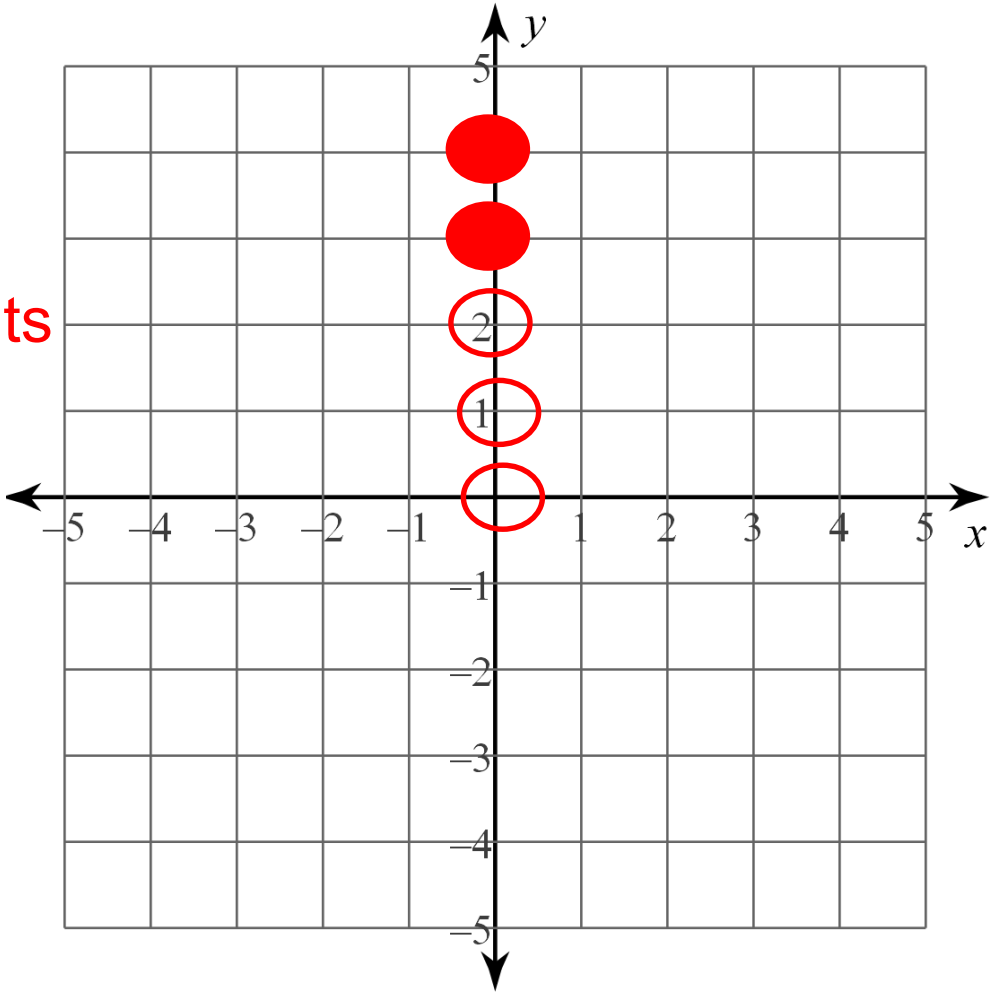
Is (0, 0) a solution?

$$0 \geq 0 + 3$$

Make "open circles" on points that are NOT solutions.

Fill in the table:

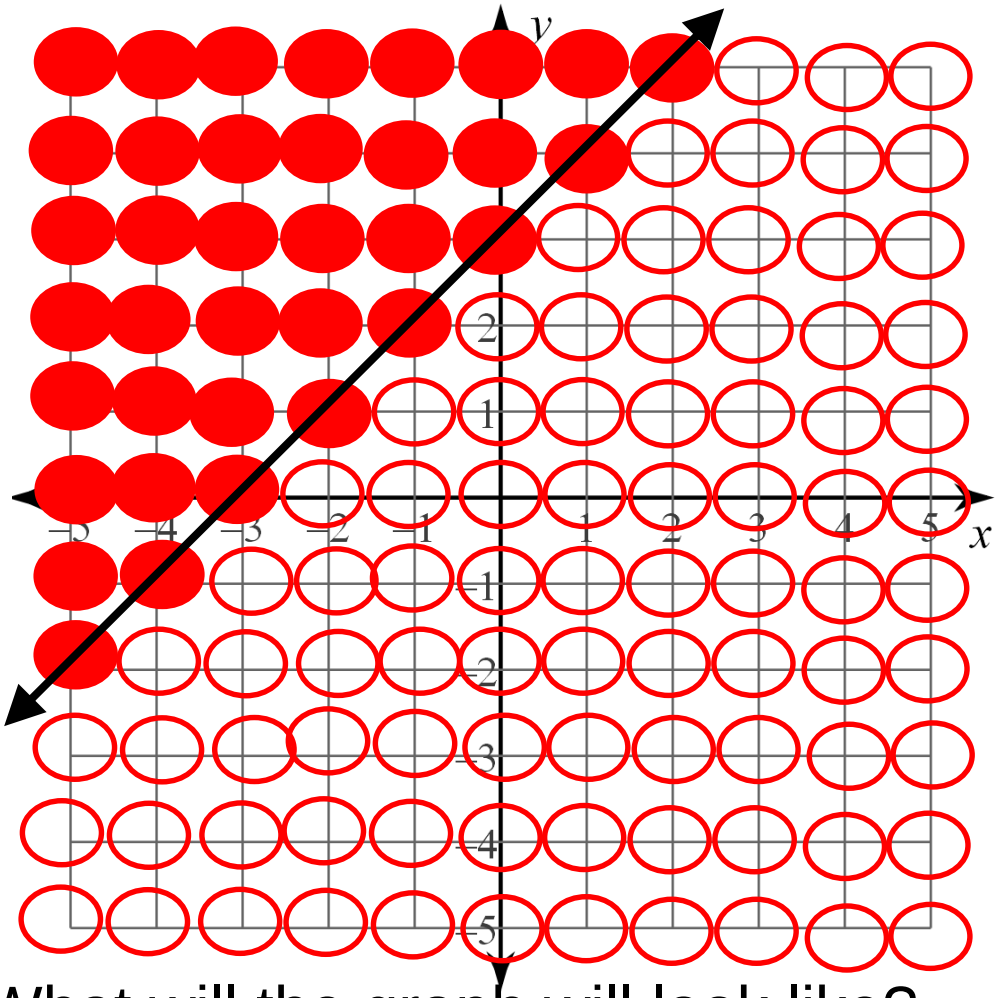
x	y	solution ?
0	0	no
0	1	no
0	2	no
0	3	yes
0	4	yes



Make "closed circles" on points that ARE solutions.

$$y \geq x + 3$$

x	y	solution ?
-1	0	no
-1	1	no
-1	2	yes
-1	3	yes
-2	0	no
-2	1	yes
-2	2	yes
-3	0	yes
-3	1	yes
-3	2	yes

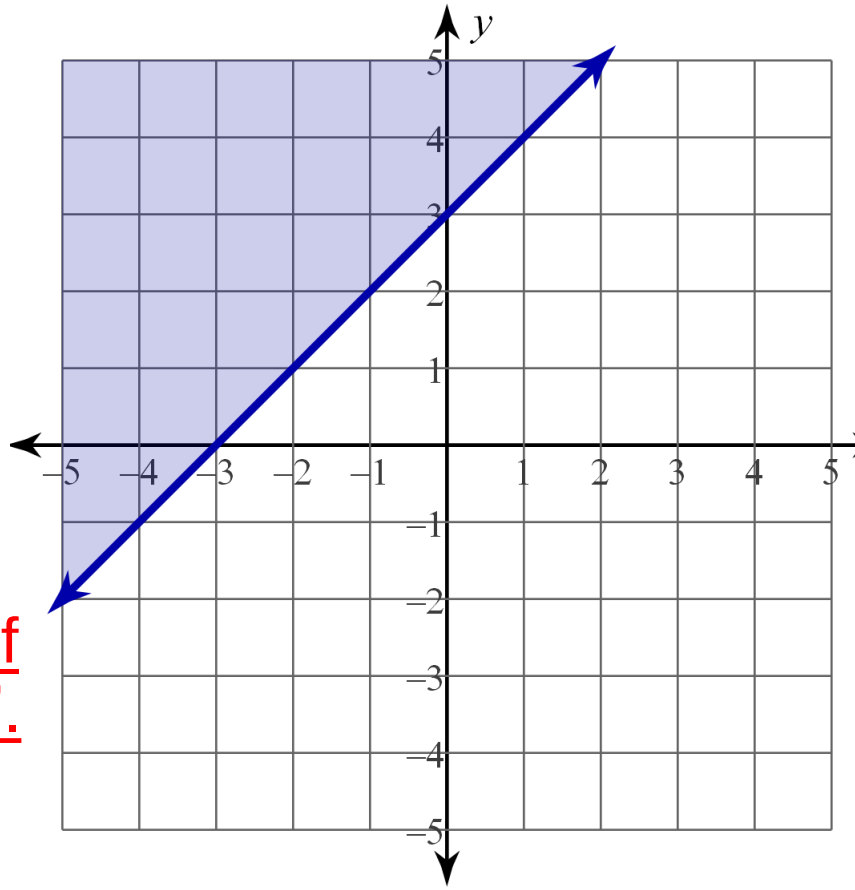


What will the graph will look like?

Every point above the line will be a solution.

Every point below the line will NOT.

$$y \geq x + 3$$



The line: y = x + 3
Divides the x-y plane into two halves.

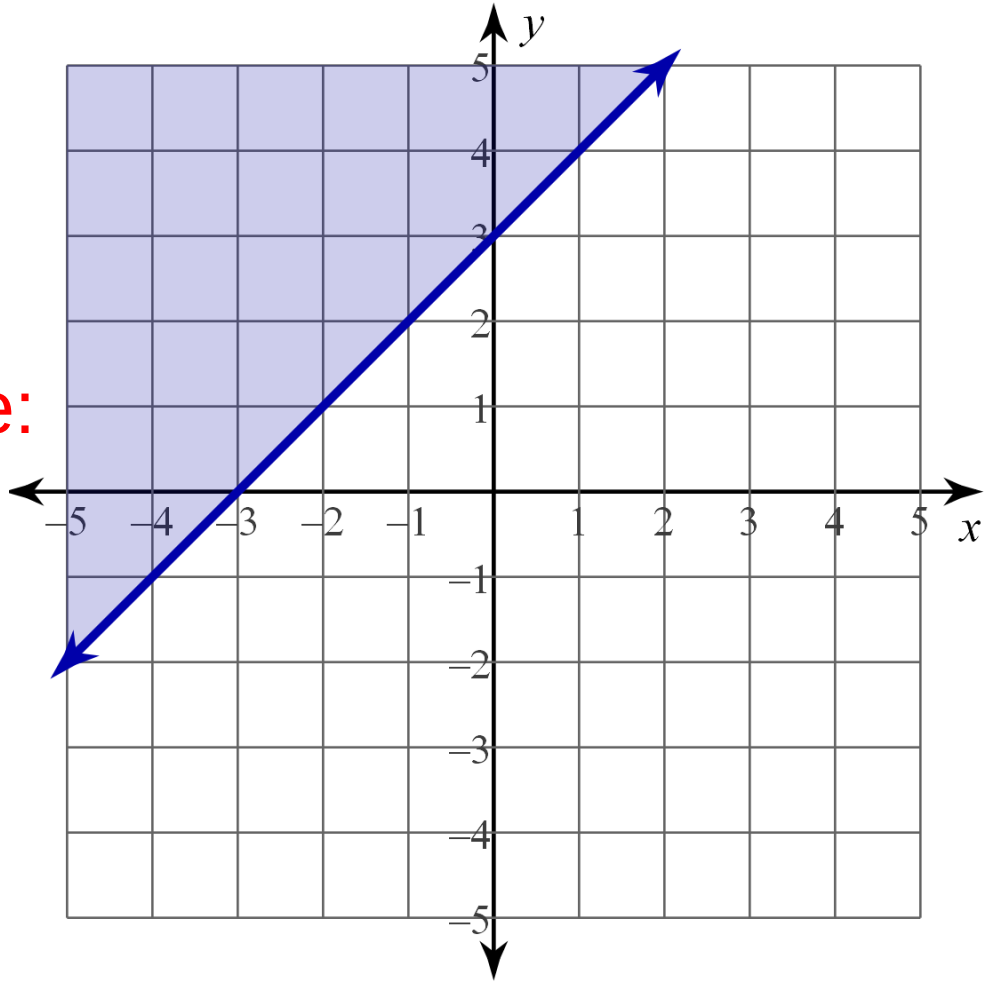
The solution to the inequality is all of the points in one of the "half planes".

Do the points on the boundary line make the inequality true?

$$y > x + 3$$

Now it is just “>” not “≥”

Test two points one the line:
(0, 3)
(-1, 2)



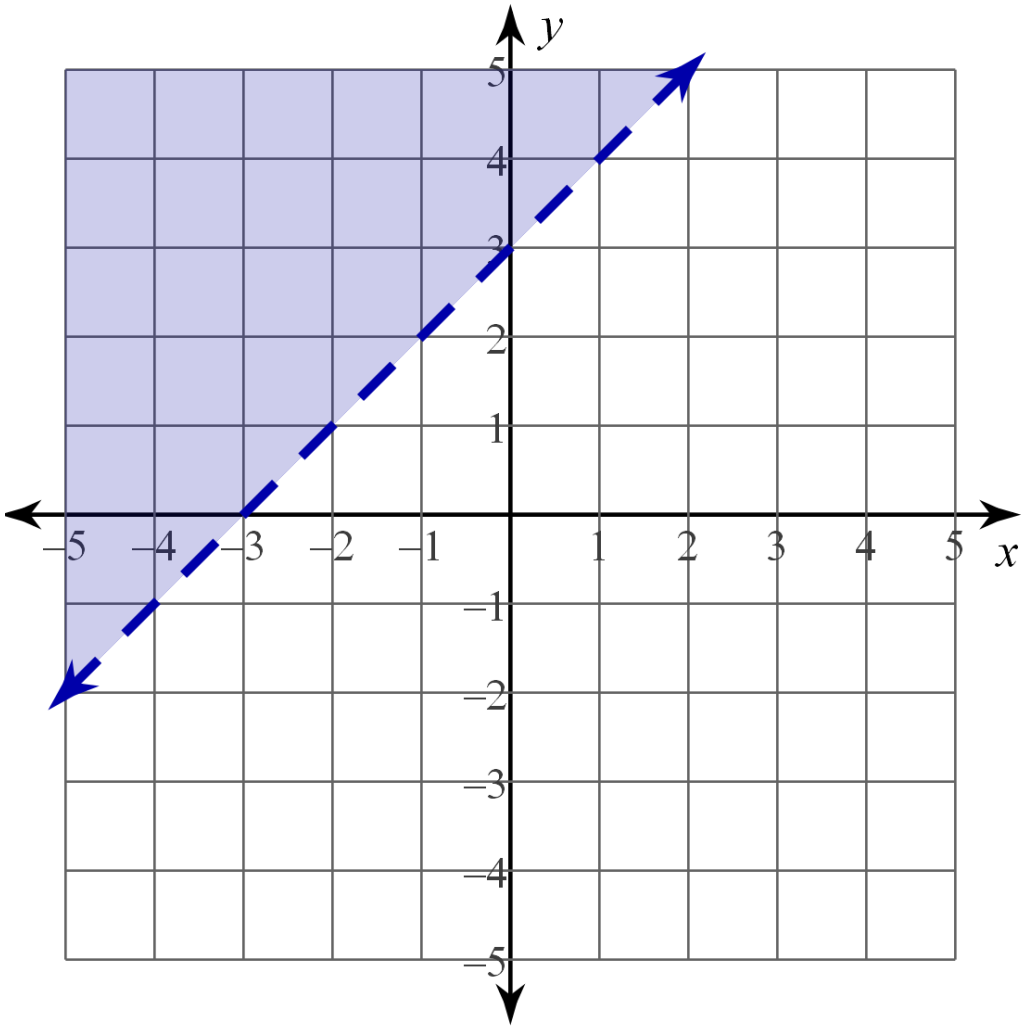
Do the points <u>on the line</u> make the inequality true?

no

How do we show that the points on the line are NOT solutions of the inequality?

DO NOT shade those points.

$y > x + 3$



An “unshaded” line is a dotted line.

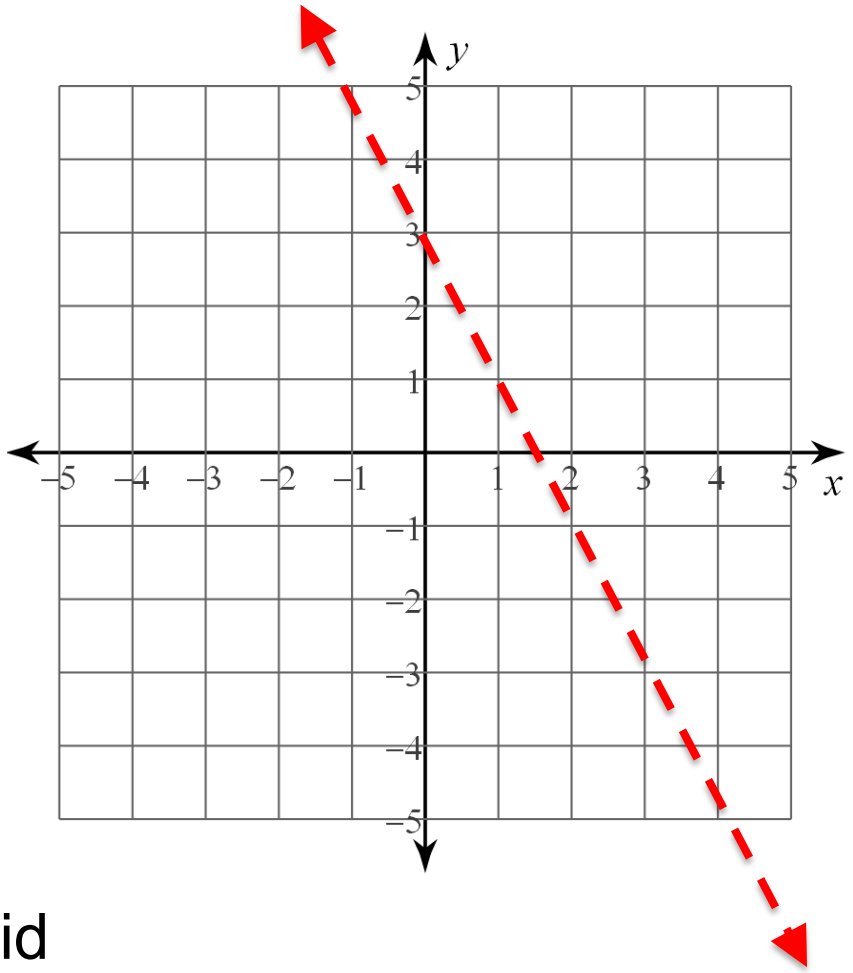
Let's write a procedure on how to graph 2-variable inequalities.

$$y > -2x + 3$$

1. Graph the line.

$$y = -2x + 3$$

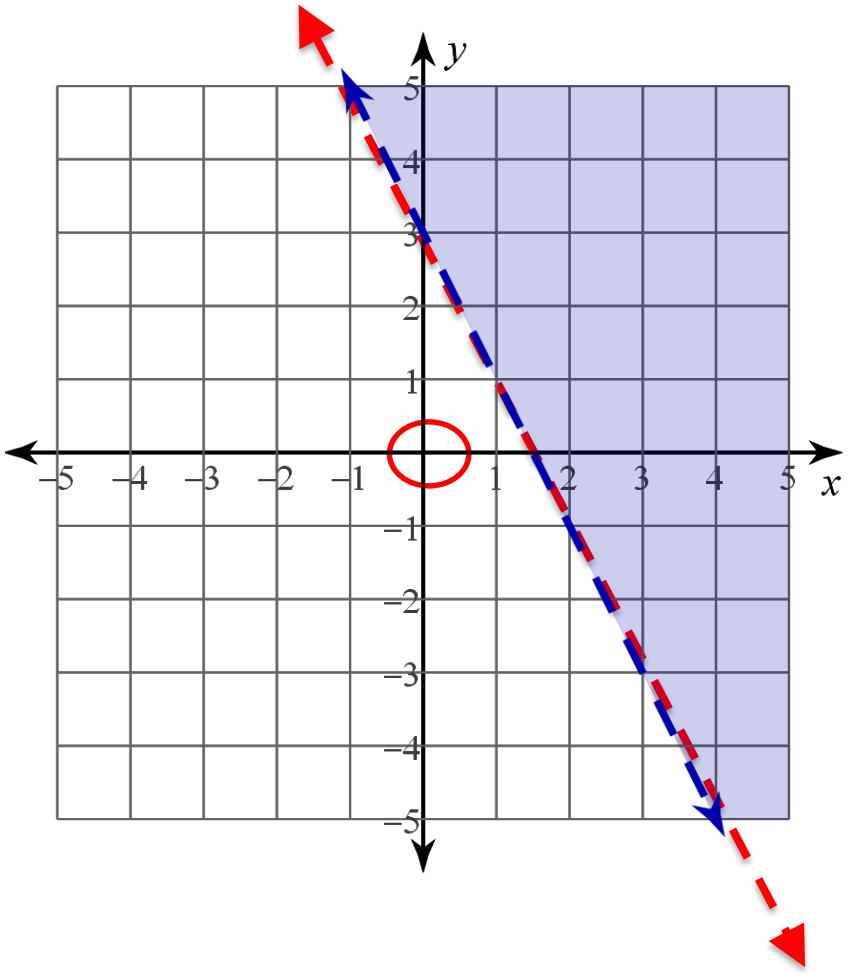
2. If the inequality is ">" (not "≥"), the line will be dotted (not shaded).



3. If it is "≥" the line will be solid (shaded).

$$y > -2x + 3$$

4. Test a point on <u>one side of the boundary line.</u> If that point is a solution, shade that side of the line, (otherwise shade the other side).



(0, 0)

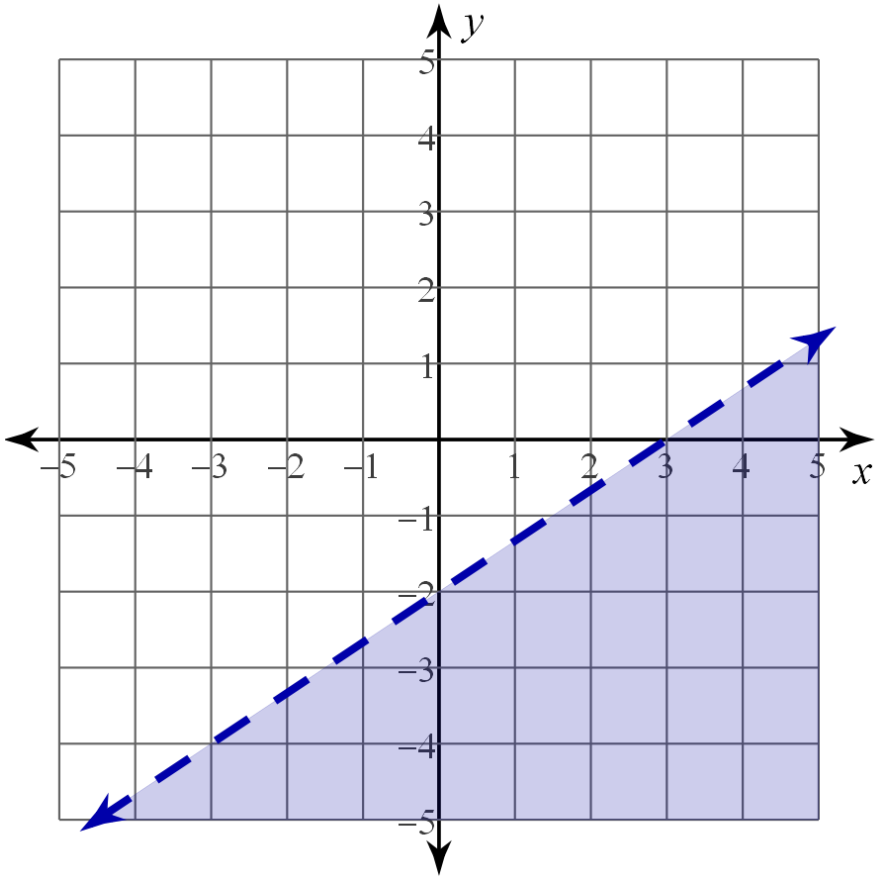
$0 > -2(0) + 3$ no

Shade other side of line from (0, 0)

Graph the following inequality.

$$2x - 3y > 6$$

Why does “>” end up being shaded below the line?



Non-linear 2 Variable inequality

$$y < (x+2)^3 + 2$$

Is the curve solid or dotted?

Is the solution the region above or below the curve?