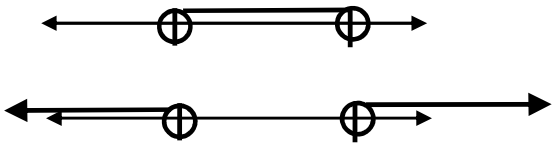
SM2 HANDOUT 6-2 (Two Variable Inequalities)

Solve $0 > x^2 - x - 12$

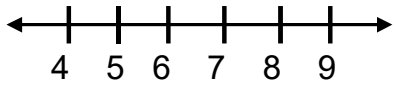
The boundary #'s separate the solution from the non-solution.



Test one value of 'x' to see if it is a solution. Try x = 0.

Graph the solution to the compound inequality:

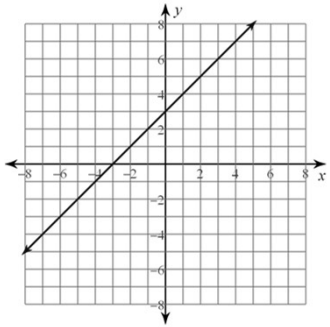
$x \leq 6$ or $x > 8$



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

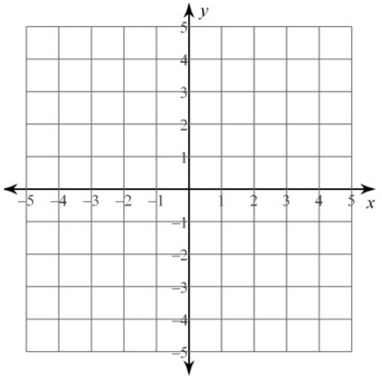
What is the <u>solution</u> to a two-variable equation?

$y = x + 3$



What is the <u>solution</u> to a two-variable inequality

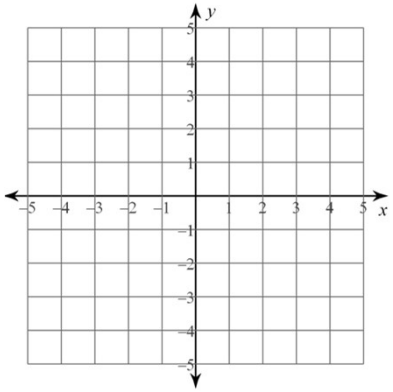
$y \geq x + 3$



$y \geq x + 3$

Fill in the table:

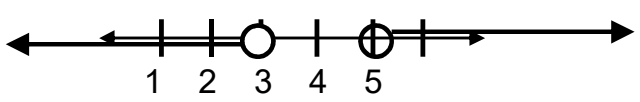
x	y	solution ?
-1	0	
-1	1	
-1	2	
-2	0	
-2	1	
-2	2	
-3	0	
-3	1	



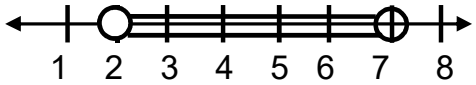
Can you tell what the graph will look like?

Single Variable Inequality: The "boundary numbers" separate the solution from the non-solution.

$x \leq 3$ or $x > 5$



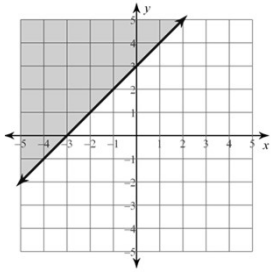
$2 \leq x < 7$



The shaded part of the graph is the solution.

$y \geq x + 3$

The line: y = x + 3
Is the boundary between the solution and non-solution.



The line divides the x-y plane into two halves.
The solution to the inequality is all of the x-y pairs in one of the "half planes".

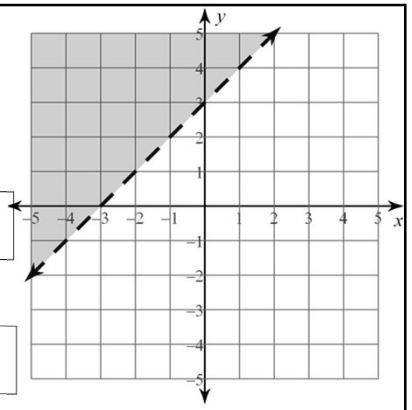
$y > x + 3$

Now it is just ">" (not "≥")

Test a point on the line:
(0, 3)

Do the points on the line make the inequality true?

How do we show that on the graph?



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

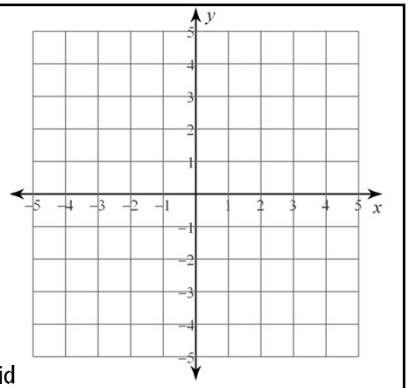
$$y > -2x + 3$$

1. Graph the line.

$$y = -2x + 3$$

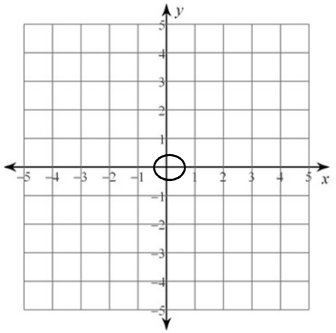
2. If the inequality is ">" (not "≥"), the line will be dotted (not shaded).

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



$$y > -2x + 3$$

4. Pick a point and see if it is the solution. If so, shade that side of the line, (otherwise shade the other side).

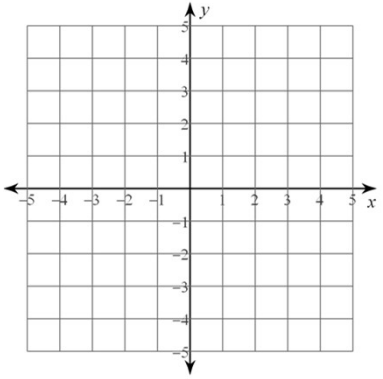


Shade other side of line from (0, 0)

Graph the following inequality.

$$2x - 3y > 6$$

Why does ">" end up being shaded below the line?



Non-linear 2 Variable inequality

$$y > x^2 - 2$$

Is the parabola solid or dotted?

Is the solution the region above or below the parabola?