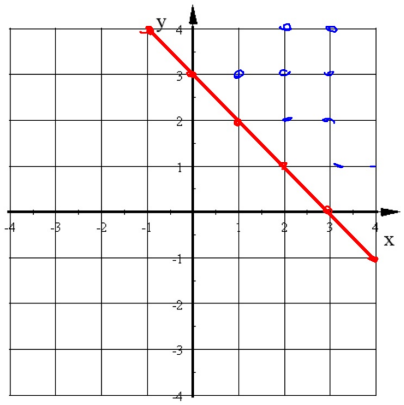
Algegra 1 Sec 7-5:

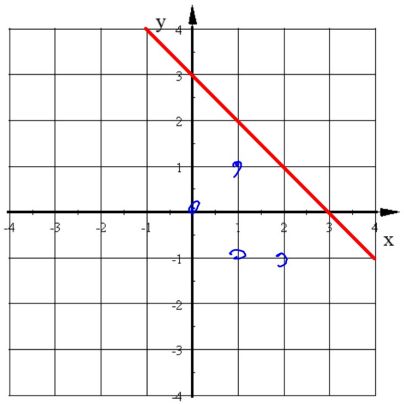
Graph this line below: $y \geq -x + 3$



Pick 3 points ABOVE the line and substitute these x and y values into the equation. Do they make the equation true?

Point	y	-x + 3
(2,2)	2 >	1
(3,1)	1 >	0
(4,4)	4 >	-1

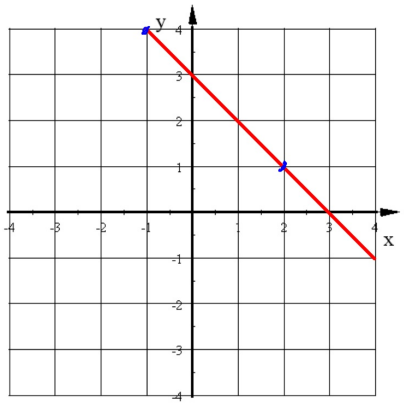
$y \leq -x + 3$



What would happen if we picked points BELOW the line and substituted the x and y values into the equation?

Point	y	-x + 3
(-1,1)	1 <	4
(2,-2)	-2 <	1
(0,0)	0 <	3

$y = -x + 3$



What would happen if we picked points ON the line and substituted the x and y values into the equation?

Point	y	-x + 3
(2,1)	1	=-2+3=1
(3,0)	0	=-3+3=0
(-1,4)	4	=(-1)+3=4

$y = -x + 3$ Points ON the line make this EQUATION true

$y > -x + 3$ Points above the line make this INEQUALITY true

$y < -x + 3$ Points below the line make this INEQUALITY true

The graph of a linear inequality:

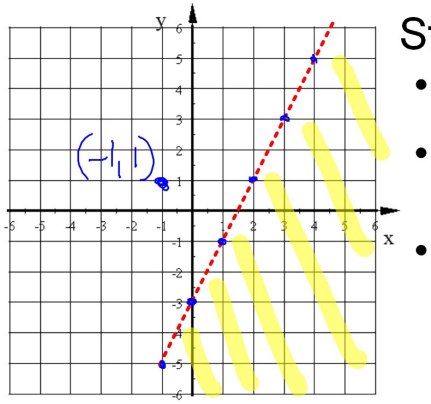
- A boundary line that is either dashed or solid.
- The SOLUTION REGION is all the points on one side of the boundary line that make the inequality true.

Graph the inequality $y < 2x - 3$

$1 < 2(-1) - 3$

$1 < -5$

(-1,1) makes the inequality false so shade the other side.



Steps:

- Place dots on the graph to represent the location of the line.
- Connect the dots with either a solid line: $\leq$ or $\geq$ or a dashed line: $<$ or $>$
- Shade the side of the line that shows all the points that make the inequality true.

Which side of the line to shade for an inequality?

If inequality is in Slope-Intercept Form:

- $y > mx + b$ or $y \geq mx + b$ means to shade above the line.

If you say " y is greater" shade above the line.

- $y < mx + b$ or $y \leq mx + b$ means to shade below the line.

If you say " y is less" shade below the line.

Which side to shade?

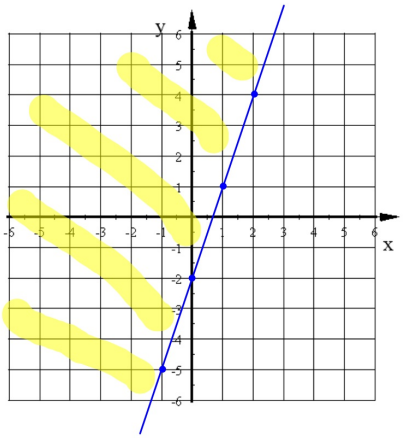
If inequality is in Standard Form: $Ax + By = C$

Pick any point NOT on the line and test it in the inequality.

- If It makes the inequality true shade the side with that point
- If it makes the inequality false shade the other side of the line.

Graph each inequality.

1. $y \geq 3x - 2$



2. $4x - 6y < 12$

0 < 12 x-int $\frac{12}{4} = 3$ y-int $\frac{12}{-6} = -2$