Algebra I: 7.1 Guided Notes **Name** _____ **Period** _____
Graphing Inequalities

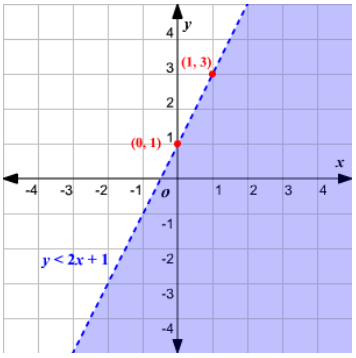
Learning Goals:
Determine which type of line on a graph represents a given inequality.
Graph an inequality in two variables.
Interpret the solutions of inequalities algebraically and contextually.

Recall

A linear inequality describes a region of the coordinate plane that has a boundary line.

The solutions of an inequality are the ordered pairs (x, y) that make the inequality TRUE.

The ordered pairs are located in the SHADED area of the graph and on the SOLID LINE.



Inequality Symbol	Boundary Line	Shaded Area
≤	Solid	Below the line
≥	Solid	Above the line
<	Dashed	Below the line
>	Dashed	Above the line

Determine the Boundary Line and Shaded Area for a Given Inequality

Steps:

- Write the equation in slope-intercept form.
- If the inequality is ≤ or ≥, the line is solid. If the inequality is < or >, the line is dashed.
- If the inequality is > or ≥, shade above. If the inequality is < or ≤, shade below.

Does each linear inequality have a dashed or solid line and do you shade above or below the line?

1. $y \geq 3x - 2$

   solid line
   shade above

2. $3y - 5x < -12$

   $y < \frac{5}{3}x - 4$
   dashed line
   shade below

Graph a Linear Inequality in Two Variables

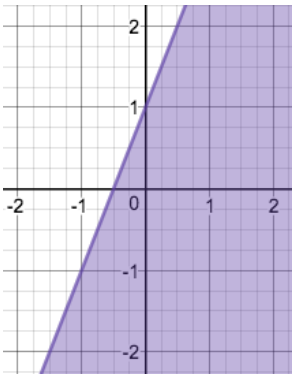
Steps:

- Write the inequality in slope-intercept form. *Remember to reverse the inequality sign if you multiply or divide by a negative number.*
- Graph the equation, i.e. $y = 2x + 1$ and $y = 3x - 5$, using a solid or dashed boundary line.
- Shade above or below the line.
- *If you are not sure what side to shade, choose a **test point** and see if it is a solution for the inequality.*

Graph each linear inequality.

3. $y - 1 \le 2x$

$y \le 2x + 1$

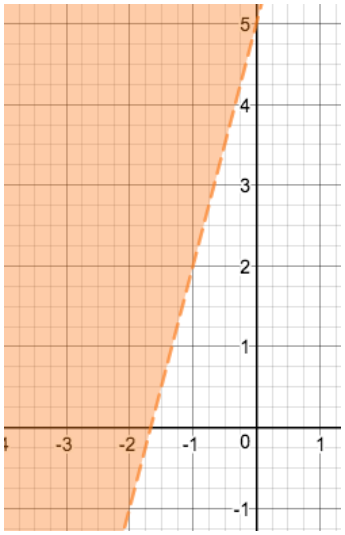


4. $-y < -3x + 5$

$y > 3x - 5$

Check
See if (–2 , 0) is a solution for the inequality.

0 > 3(–2) - 5
0 > –6 – 5
0 > –11
True. So shade to the left of the line.



Determine if a Given Point is a Solution to a Linear Inequality

Steps:

- Replace x and y with their respective values.
- Simplify.
- If the inequality is TRUE, then the ordered pair is a SOLUTION.
- If the inequality is FALSE, then the ordered pair is NOT a solution.

Determine if the ordered pair is a solution for the given linear inequality.

5. $y \le -2x + 1$; Point (2, 2)

2 ≤ -2(2) + 1
2 ≤ -4 + 1
2 ≤ -3 (2, 2) is not a solution

6. $y \ge 3x - 2$; Point (0, 0)

0 ≥ 3(0) – 2
0 ≥ 0 – 2
0 ≥ –2 (0, 0) is a solution