

Name \_\_\_\_\_

Date \_\_\_\_\_

## Linear Inequalities in 2 Variables

Why is it called “2 variables”? Because **2 different letters** (x and y) in a single inequality

Inequalities come in 2 forms...

$$y > mx + b$$

OR

$$Ax + By > C$$

\*Have to do algebra to turn into  $y > mx + b$

### How to Solve? **Solve by Graphing**

1. Graph the linear equation
2. Determine if the boundary is a part of the solution region

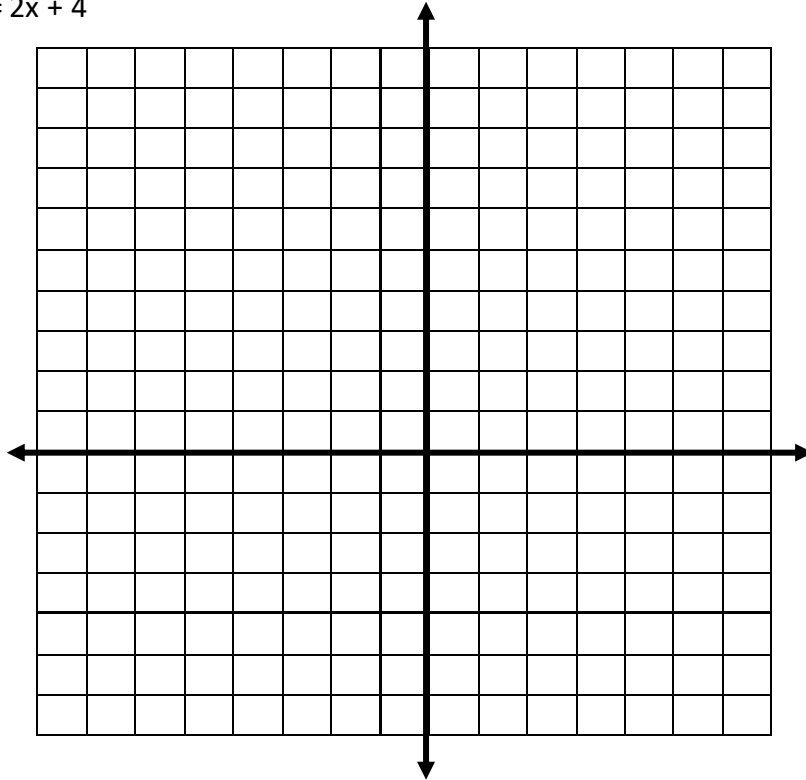
Yes	No
$\geq, \leq$	$>, <, \neq$

\*If boundary is **not** included in the solution region, use dashed lines

3. Shade the solution region
4. State the solution

Example. Find the solution to  $y \geq 2x + 4$

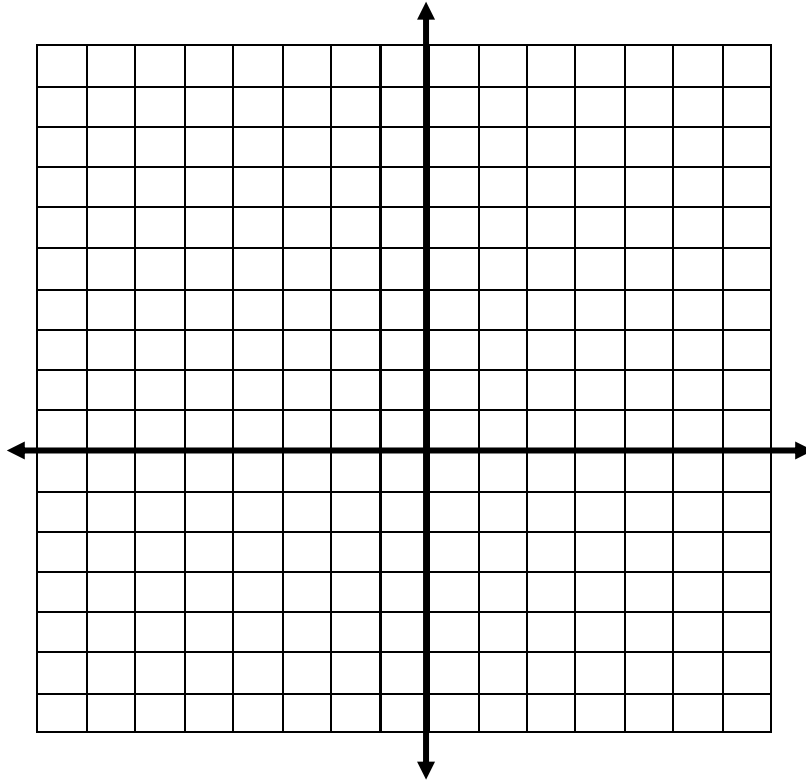
1. Graph  $y = 2x + 4$



2. Boundary ( is / is not ) a part of the solution region
3. Shade the solution region
4. The solution to  $y \geq 2x + 4$  is a region ( above / below )  $y = 2x + 4$   
( including / not including ) the points on the line  $y = 2x + 4$

Ex-1) Find the solution to  $y \leq 3x - 6$

1. Graph  $y = 3x - 6$



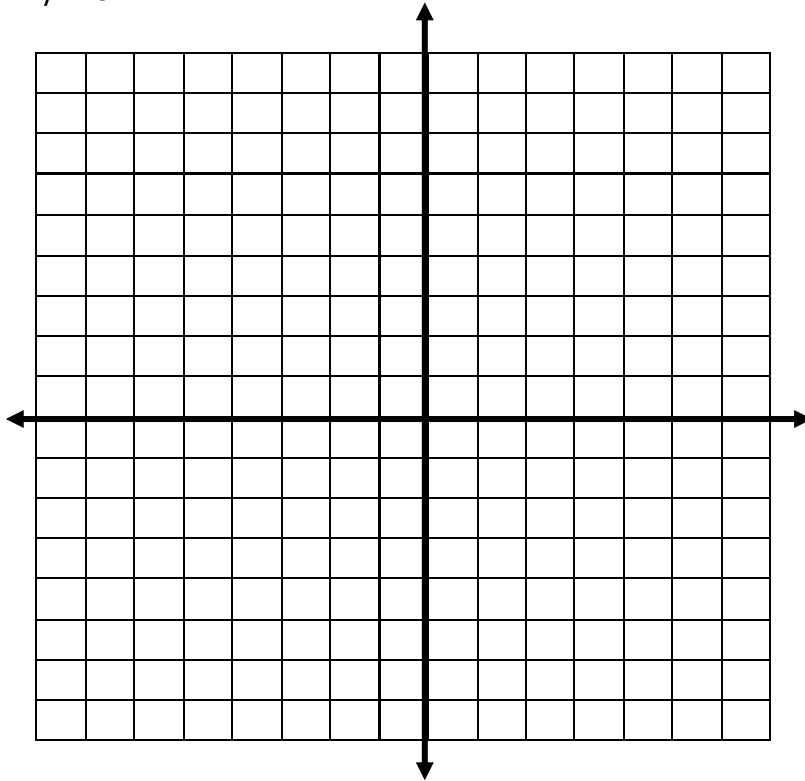
2. Boundary ( is / is not ) a part of the solution region

3. Shade the solution region

4. The solution to  $y \leq 3x - 6$  is a region ( above / below )  $y = 3x - 6$   
( including / not including ) the points on the line  $y = 3x - 6$

Ex-2) Find the solution to  $2x + 4y > 6$

1. Graph  $2x + 4y = 6$

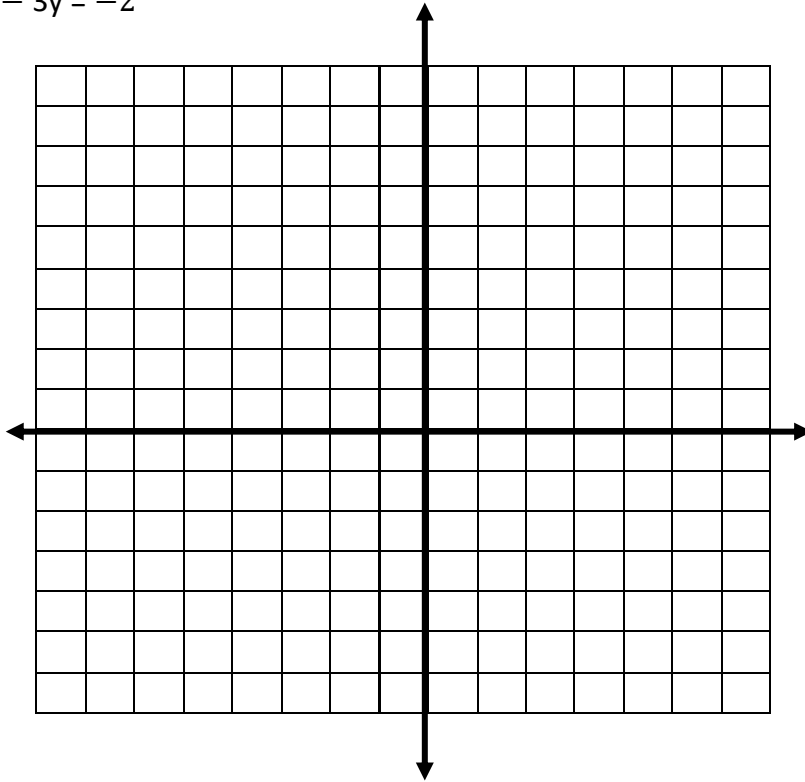


\*Note: Remember to do algebra to change  $Ax + By > C$  into  $y > ax + b$

2. Boundary ( is / is not ) a part of the solution region
3. Shade the solution region
4. The solution to  $2x + 4y > 6$  is a region ( above / below )  $2x + 4y = 6$   
( including / not including ) the points on the line  $2x + 4y = 6$

Ex-3) Find the solution to  $5x - 3y < -2$

1. Graph  $5x - 3y = -2$

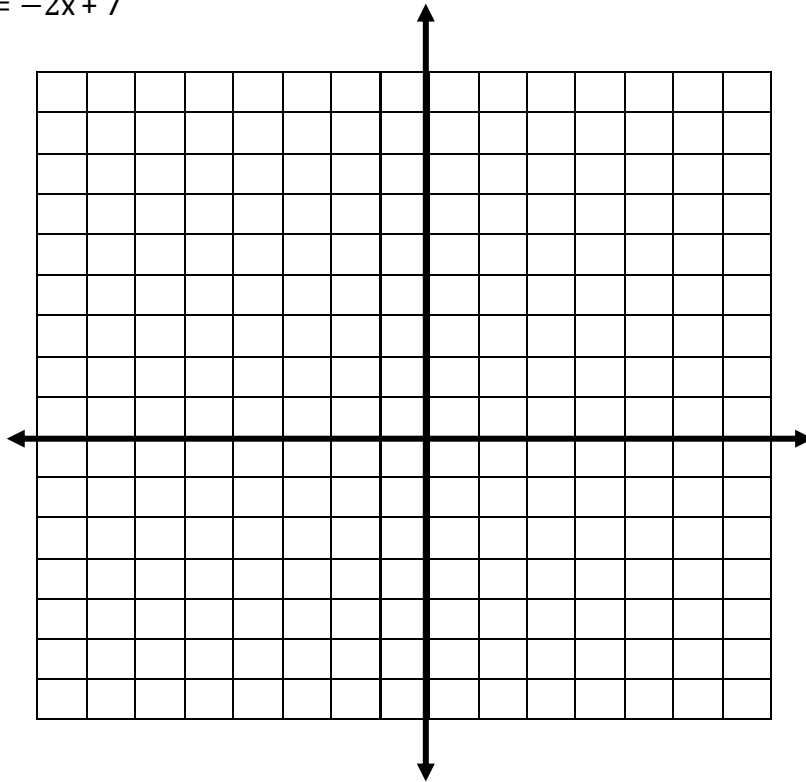


\*Note: “y” should be on the right side of the inequality sign

1. Boundary ( is / is not ) a part of the solution region
2. Shade the solution region
3. The solution to  $5x - 3y < -2$  is a region ( above / below )  $5x - 3y = -2$   
( including / not including ) the points on the line  $5x - 3y = -2$

Ex-4) Find the solution to  $y \neq -2x + 7$

1. Graph  $y = -2x + 7$



1. Boundary ( is / is not ) a part of the solution region
2. Shade the solution region
3. The solution to  $y \neq -2x + 7$  is a region ( above / below )  $y = -2x + 7$   
( including / not including ) the points on the line  $y = -2x + 7$