

## Lesson 4 Graphing Linear Inequalities

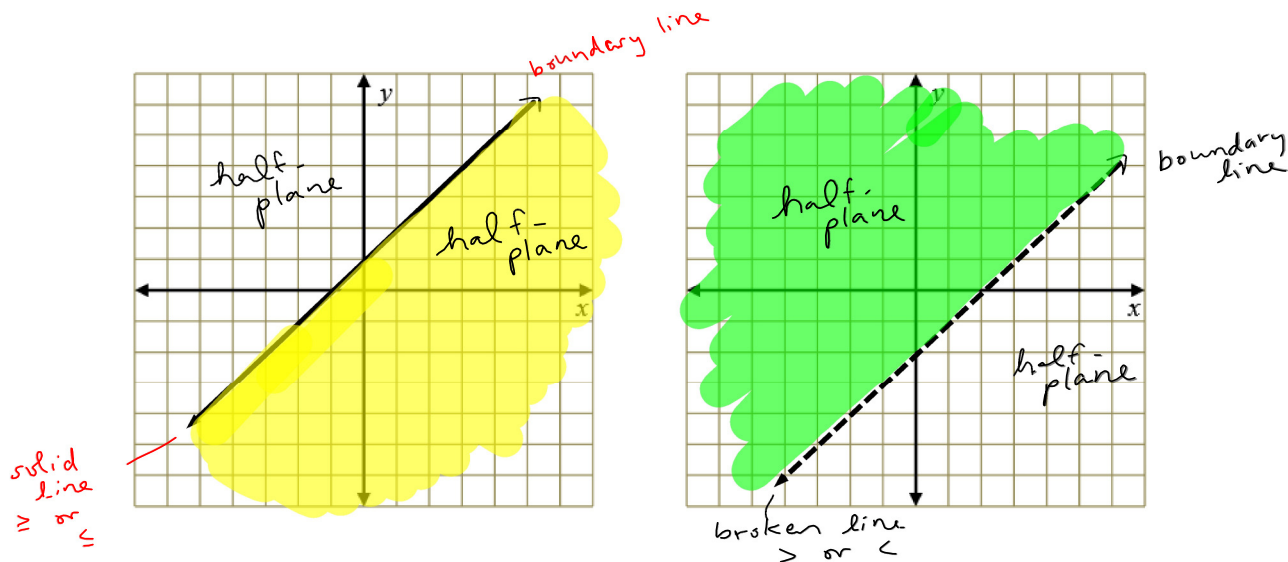
### Steps to Graphing Linear Inequalities

- Graph the equation using  $y = mx + b$  ← boundary line
  - Use a dotted/dashed line if original is  $<$  or  $>$  ← points not included in sol'n
  - Use a solid line if original is  $\leq$  or  $\geq$  ← points are included
- Determine which side to shade
  - Choose a test point NOT on the line and substitute into original inequality
    - If TRUE, shade side containing the point
    - If FALSE, shade opposite side (NOT containing the point)

**Note:**

- $(0, 0)$  is the easiest test point to use, unless the graph passes through it
- The solution will be a half-plane

The graph of a line separates the graph into 3 distinct regions.



**Example 1**

Sketch the inequalities:

solid a.)  $y \leq -2x + 4$  *oblique line*

① Sketch boundary line  
 $y = -2x + 4$

Plot y-int  
Use slope to get 2nd pt  
 $m = \frac{\text{rise}}{\text{run}} = -\frac{2}{1}$

② Test point

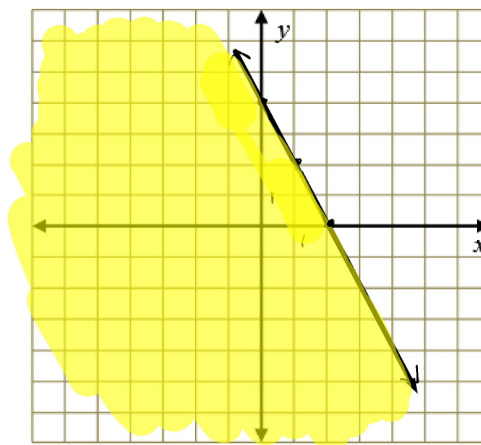
$(0, 0)$   
 $\begin{matrix} x \\ y \end{matrix}$

$y \leq -2x + 4$

$0 \leq -2(0) + 4$

$0 \leq 4$  True

$\therefore$  shade half-plane where  $(0, 0)$  lies



b.)  $3x - y > 3$  *broken*

$3x - y = 3$

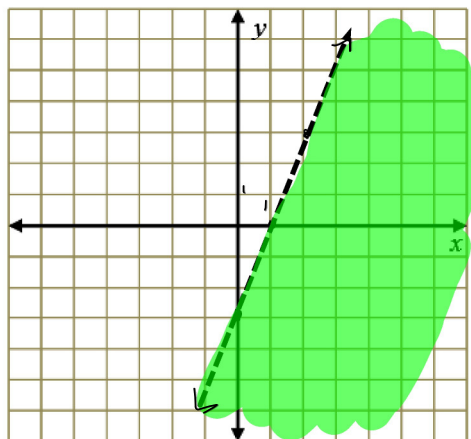
$3x - 3 = y$

Test  $(0, 0)$

$3(0) - 0 \not> 3$

$0 \not> 3$  False

$\therefore$  shade opposite half-plane



# SI L4 Graphing Linear Inequalities.notebook

## Pre-Calculus 11 Enriched Systems of Equations & Inequalities

c.)  $2x - 3y \geq 6$  *solid*

$$2x - 3y = 6$$

$$2x - 6 = 3y$$

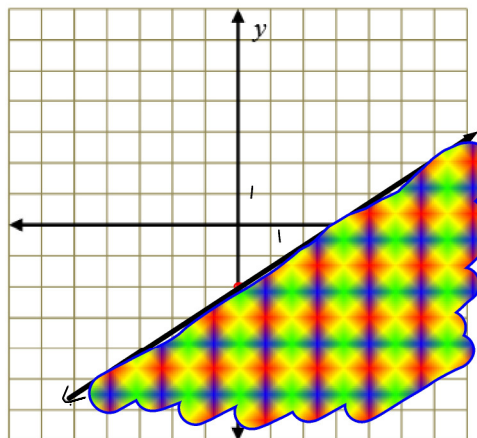
$$\frac{2}{3}x - 2 = y$$

Test  $(0, 0)$

$$2x - 3y \geq 6$$

$$2(0) - 3(0) \geq 6$$

$$0 \geq 6 \text{ False}$$



d.)  $y - 3 \geq 0$

$$y - 3 = 0$$

$$y = 3$$

$$0 - 3 \geq 0$$

$$-3 \geq 0$$

pg 321  
# 3a, b, e, f, g, h

