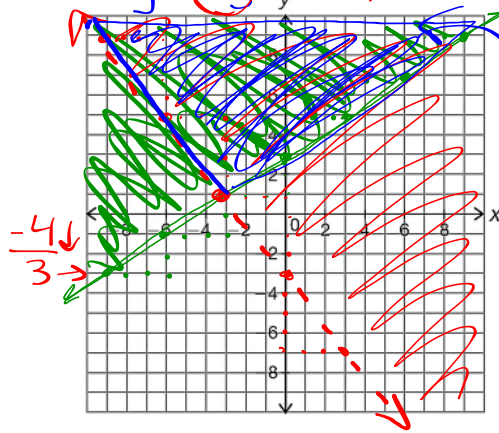


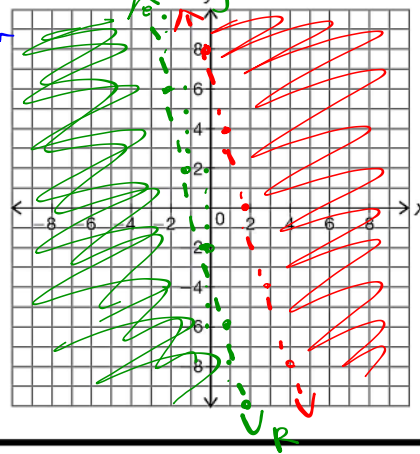
Foundations of Algebra  
 $C. y > \frac{2}{3}x + 3$   
 $y > \frac{2}{3}x + 3$   
 $y < \frac{2}{3}x - 3$

Unit 6: Systems of Equations & Inequalities

$y > -4x + 8$  above  
 $y < -4x - 2$  below



solution



No solution

Graphing a System of Inequalities in Standard Form

Think Back.....What is the "Golden Rule" of inequalities?

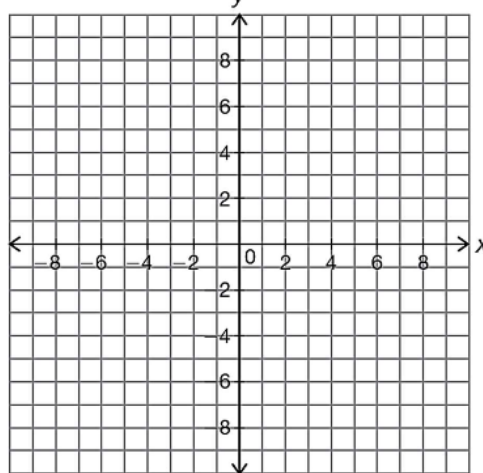
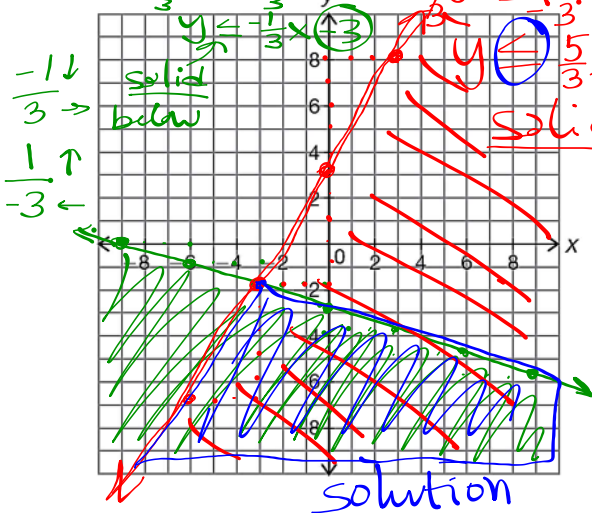
If you divide OR multiply by a negative:  
~~×~~ FLIP THE SIGN ~~×~~

E.  $x + 3y \leq -9$

$5x - 3y \geq -9$

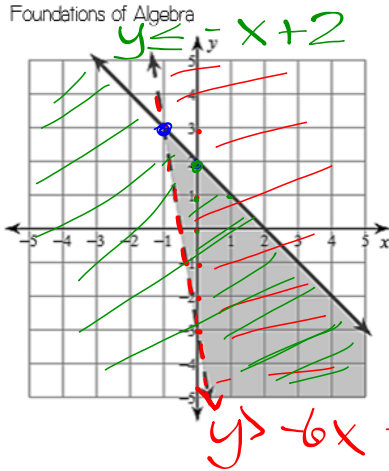
F.  $x + y \geq -3$

$4x - y \leq -2$



Warning...Potential Misconception!!!

Do you think the point  $(-1, 3)$  is a solution to the inequality?  
 $x + y \leq 2$   
 $6x + y > -3$



Unit 6: Systems of Equations & Inequalities  
 (-1, 3) no!

Notes

**Determining Solutions Located on a Boundary Line**  
 If a point lies on a **solid** line, it is a solution.  
 If a point lies on a **dashed** line, it is not a solution.  
 It must be true or a solution for both inequalities/boundary lines to be a solution!

$3 > -6(-1) - 3$   
 $3 > 6 - 3$   
 $3 > 3$  NO!

$y = -x + 2$   
 $3 \leq -(-1) + 2$   
 $3 \leq +1 + 2$   
 $3 \leq 3$  yes!

**Create a System of Inequalities from a Graph**

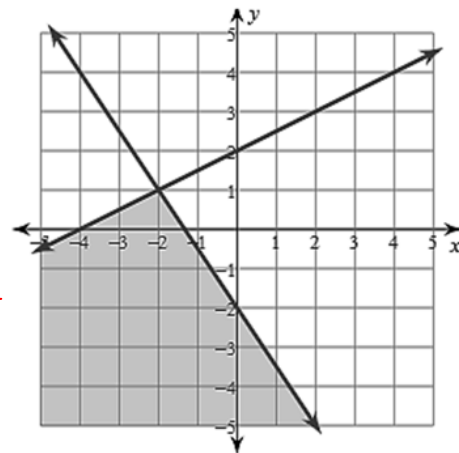
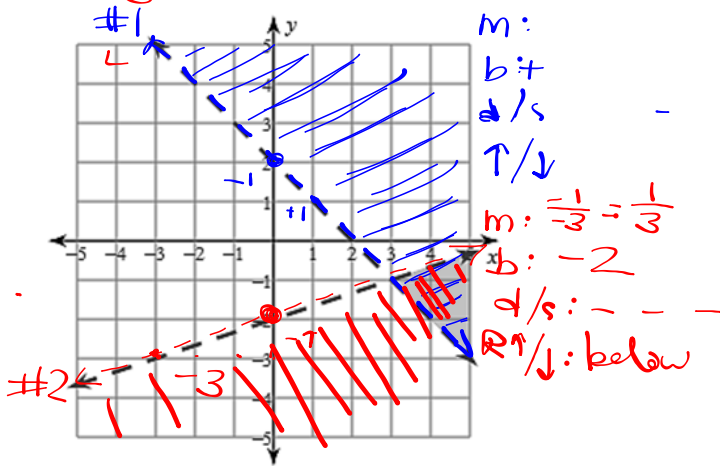
What information do you need to look at to name a system of inequalities from a graph?

- slope (m)
- y-int (b)
- dashed/solid
- above/below

**Practice:** Name each system of inequalities from the graph:

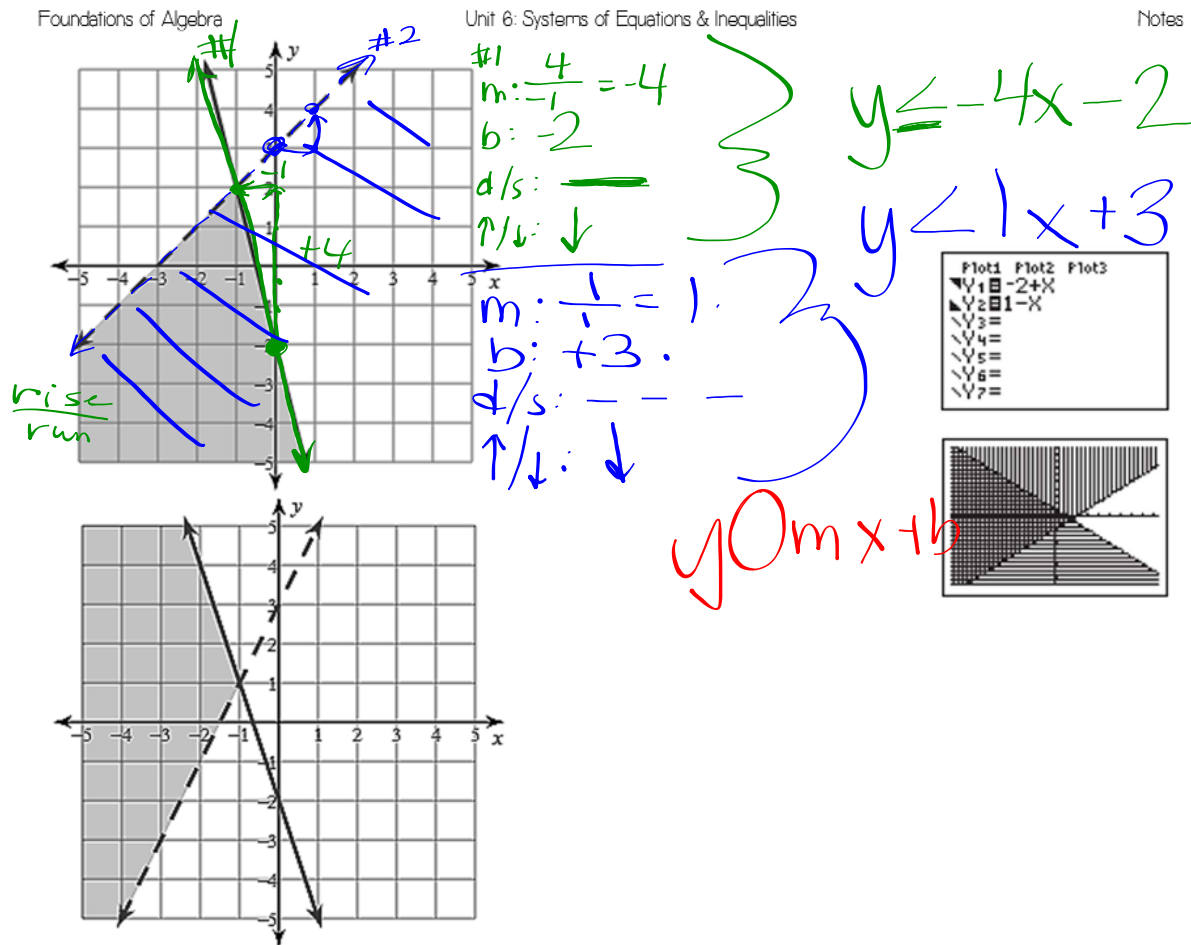
Line 1:  $y > -x + 2$   
 Line 2:  $y < \frac{1}{3}x - 2$

Line 1: \_\_\_\_\_  
 Line 2: \_\_\_\_\_



Line 1: \_\_\_\_\_  
 Line 2: \_\_\_\_\_

Line 1: \_\_\_\_\_  
 Line 2: \_\_\_\_\_



Using a Graphing Calculator to Solve a Systems of Inequalities

**Example:** Use your graphing calculator to name three solutions to the system of inequalities:  $y \geq -2 + x$   
 $y \leq 1 - x$

**Step 1:** Hit **Y=** and enter your equations into the  $Y_1$  and  $Y_2$  spots.

**Step 2:** Move the cursor to the left of  $Y_1$  and press **ENTER** until you see the graph style that describes the shading of your inequality symbols ( $>/\geq$  will shade above and  $</\leq$  will shade below). You have to tell the calculator what direction to shade so it is crucial you understanding how the shading relates to the inequality symbol.

**Step 3:** Do the same thing for  $Y_2$ .

**Step 4:** Hit **GRAPH**.

Using your graphing calculator is a great way to check to see if you graphed your systems of inequalities correctly.