Two Variable Inequalities

Things get a little more interesting when we are plotting linear inequalities with two variables.

1) Let's start with a basic two-variable inequality: $y < x$.

a) Is the coordinate pair $(-4, 2)$ a solution to the inequality $y < x$? Record your thinking.

False! $2 < -4$ $(-4,2)$ is NOT a sol'n

b) Is the coordinate pair $(-1, -2)$ a solution to the inequality $y < x$? Record your thinking.

True! $-2 < -1$ $(-1,-2)$ is a sol'n

c) Is the coordinate pair $(2, 2)$ a solution to the inequality $y < x$? Record your thinking.

False! $2 < 2$ $(2,2)$ is NOT a sol'n

d) Create several coordinate pairs that are solutions to the representative equation $y = x$ to identify the boundary line of the graph of the inequality.

$y = mx + b$

$m = 1 = \frac{1}{1}$

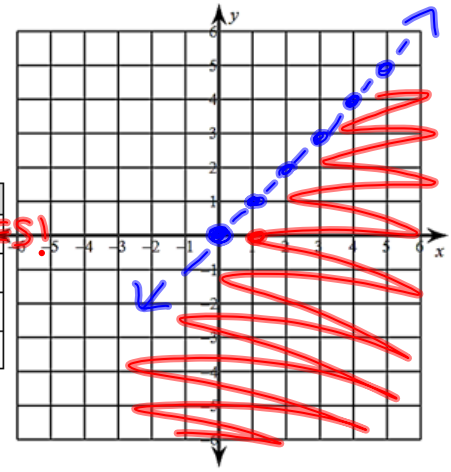
$b = 0$ start here

x					
y					

e) Graph the solution for the equation $y = x$.

→ plot points that are on the **boundary** line

→ draw the solid or dashed **line** (as identified by the inequality)



f) Locate two or more points on the graph, at least one from each side of the boundary line. Test to determine which is a solution to the inequality $y < x$.

x	y	a solution?
1	0	$0 < 1$ YES!

→ identify and plot ordered pairs that are **solutions** of the inequality $y < x$

→ **shade** the half-plane that contains all the solutions to the inequality $y < x$

g) What does the shaded region represent? Why is the boundary line dashed?

2) Graph the inequality: $y \geq 2x + 1$.

a) Create several coordinate pairs that are solutions to the representative equation $y = 2x + 1$ to identify the boundary line of the graph of the inequality.

x					
y					

m = 2

b = 1

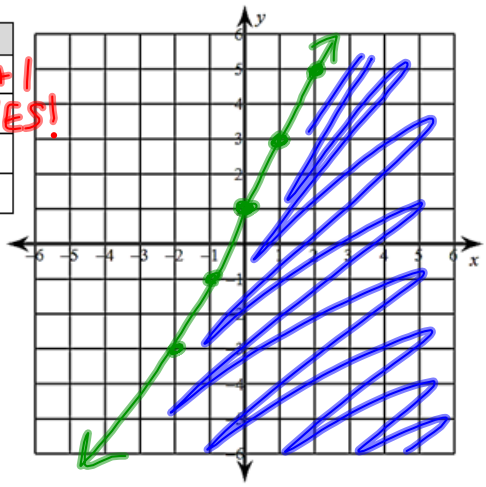
b) ~~Graph the solution for the equation $y = 2x + 1$.~~

→ plot points that are on the **boundary** line

→ draw the solid or dashed **line**
(as identified by the inequality)

c) Locate two or more points on the graph, at least one from each side of the boundary line. Test to determine which is a solution to the inequality.

x	y	Solution?
1	1	$1 \geq 2(1)+1$ $1 \geq 3$ YES!



→ identify and plot ordered pairs that are **solutions** of the inequality $y \geq 2x + 1$

→ **shade** the half-plane that contains all the solutions to the inequality $y \geq 2x + 1$

d) What does the shaded region represent? Why is the boundary line solid?

6) Graph the following inequalities.

$y \geq \frac{1}{2}x - 3$ page 13

a) $y \geq -x + 4$

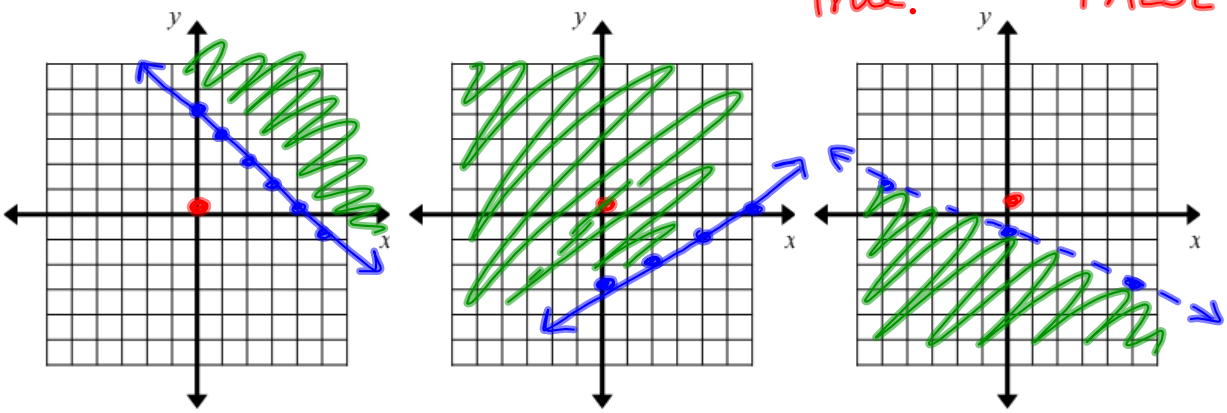
$m = -1$ $b = 4$ TEST: (0,0) $0 \geq -(0) + 4$ $0 \geq 4$ False!

b) $\frac{1}{2}x - 3 \leq y$

$m = \frac{1}{2}$ $b = -3$ TEST: (0,0) $\frac{1}{2}(0) - 3 \leq 0$ $-3 \leq 0$ True!

c) $y < -\frac{2}{5}x - 1$

$m = -\frac{2}{5}$ $b = -1$ TEST: (0,0) $0 < -1$ FALSE!



7) Describe how to graph the inequality $y < 4x - 1$ on a coordinate plane.

HOMEWORK:

UNIT 1 Part A: 3-Tri Intermediate Algebra

Name: _____ **Period:** ____

Use this guide to help you evaluate where you are at in this chapter, and identify areas that you need extra help in.

☺=Proficient (you are awesome at this) 😐=Middle (you need some improvement) ☹=Not Proficient (HELP!)

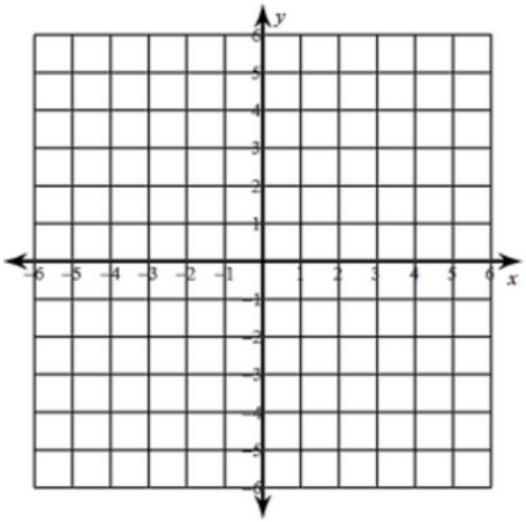
Intermediate Algebra Unit 1 : Linear Programming					
Date Covered	**LT#**	**Learning Target (LT)** (What you should know)	**Practice Problems**	**Number of Test Questions/Points**	**Self-Evaluation** (Do you know it?)
	1.1A	I Can Demonstrate Understanding of How to Represent a Region on a Graph with an Inequality	1.1 A 1-8 (P-1)	# of Questions = Points =	☹ 😐 ☺
	1.1B	I Can Demonstrate Understanding of How to Represent a Region on a Graph with an Inequality	1.1B 1-6 (P-5)	# of Questions = Points =	☹ 😐 ☺
			1.1B 7-12 (P-6)		
9/19	1.1C	I Can Demonstrate Understanding of How to Represent a Region on a Graph with an Inequality	1.1C 1-8 (P-9)	# of Questions = Points =	☹ 😐 ☺
			1.1C 9-16 (P-11)		

CORRECTIONS TO HW DIRECTIONS...

#1 – 4: Graph each inequality.

1) $y \geq 3x - 1$

x	0	
y		



Don't need tables for #1-4...

Graph using Slope and y-intercept!

#5 – 8: For each inequality and graph, pick a point and use it to determine which half-plane should be shaded, and then shade the correct half-plane.

5) $y \square 2x + 3$

Directions don't make sense...

INSTEAD: Test a point to choose the correct inequality symbol!