Algebra 1: Unit 7 Problem Set H

Mr. Chamberlain

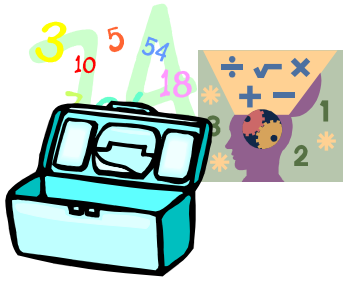
Name _____

Date _____ Period _____

(N.B. See section 7.6 of your textbook)

FYI

GRAPHING & SOLVING SYSTEMS OF LINEAR INEQUALITIES



A **system of linear inequalities** is simply two or more related linear inequalities that are graphed in the same coordinate plane.

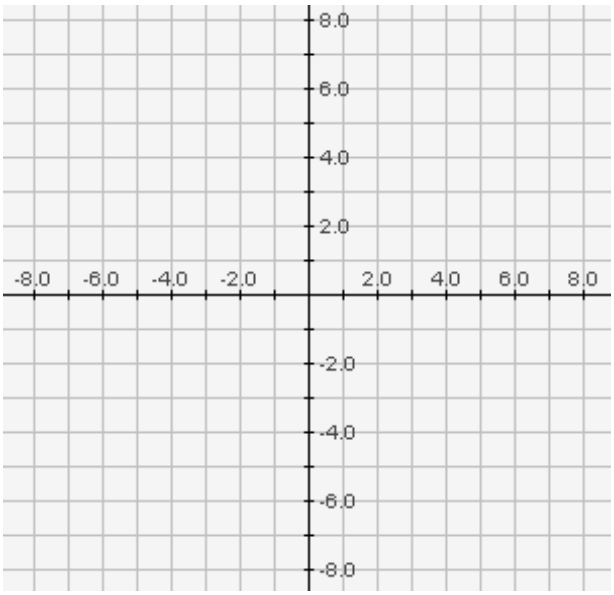
The **SOLUTION** for a system of linear inequalities is the set of all ordered pairs that satisfy both (or all) of the inequalities. This set of points is called the **SOLUTION REGION**.

The **SOLUTION REGION** is the **INTERSECTION** of the individual half-plane solutions of each inequality.

Example 1: Sketch the graph of the system of linear inequalities and shade the solution region.

$y < 2$

$y \geq \frac{1}{2}x - 2$



Hint: First graph the boundary lines (equations) for $y = 2$ and $y = \frac{1}{2}x - 2$

Caution! Dashed Line or Solid Line??

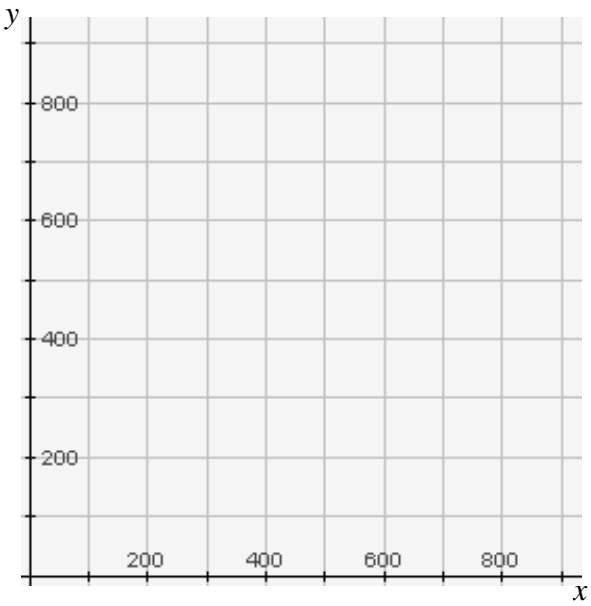
Second, lightly mark or shade each half-plane

Third, shade the intersection of the half-planes

Recall from Problem Set 6A…

1. Last Friday night, ***more than*** $1875 was paid at the gate of the high school football game. Student tickets were sold for $3.00 and adult tickets for $5.00.
New Information! The maximum capacity of the stadium is 900 people.

a) Write two inequalities that describe this situation in terms of the number of students, x, and the number of adults, y.



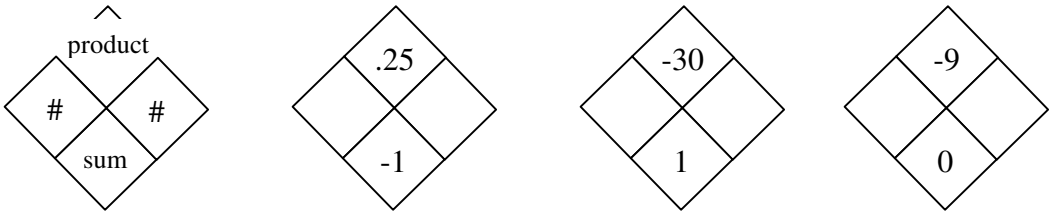
b) Using your inequalities as if they were equations, find the x- and y-intercepts for each inequality.

x	y
0	
	0

x	y
0	
	0

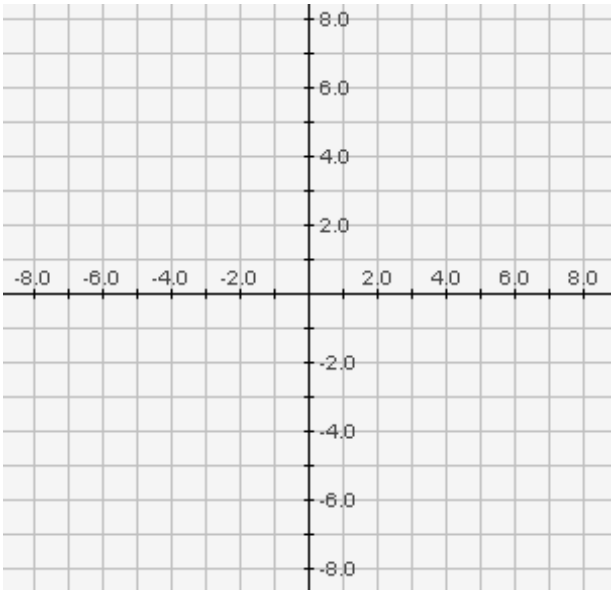
c) Sketch a graph of the system of inequalities that highlights the possible combinations of adults and students that attended the game.
Label the axes and shade the solution region.

2. Solve each of the following diamond problems:

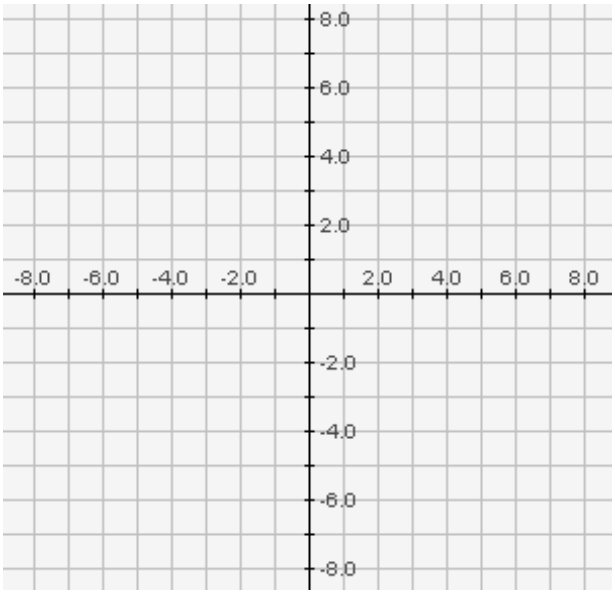


3. Sketch a graph of the systems of inequalities. Show all work.

a) $y > -4$
$y \geq 2x + 1$
$x \geq -6$



b) $x < -1$
$x \geq -7$
$y < 6$
$y \geq -3$



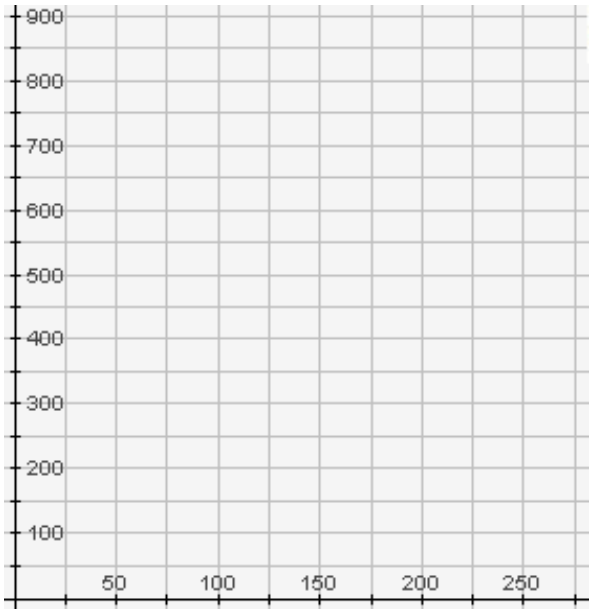
4. The student government association held a fundraising dance to raise money for the Washington D.C. trip. The Home-School Association donated $100 in cash. Students were each charged $3 admission.

New Information #1: The students held a bake sale at the dance that, if it sold out, could generate as much as another $200 profit.

New Information #2: A maximum of 250 students were allowed to attend.

Sketch a graph that shows ALL of the possibilities for money raised.

a) Write **THREE** (3) linear inequalities that describe this situation.
Let the ***x*-axis** represent the number of students attending
Let the ***y*-axis** represent the amount of money raised.



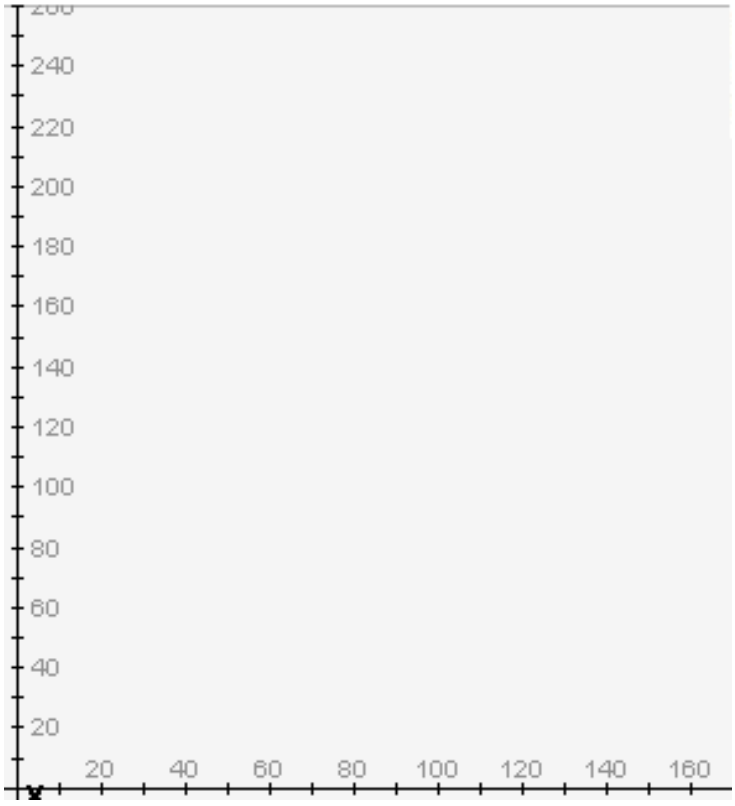
b) Sketch a graph of the boundary lines and shade the region of the graph that shows the possible solutions for total money raised. **LABEL THE AXES accordingly**.

c) Use the TEST POINTS method to confirm your solution.

5. Organizers for a party plan to serve at least 120 pounds of meat. The roast beef costs $5 per pound and the chicken costs $3 per pound. The organizers have a budget of at most $600 for meat for the party. What are the possible amounts of roast beef and chicken?

(N.B. This problem is featured on mathchamber.com/Unit 6 in the VIDEO TUTOR lesson entitled "Using a system of linear inequalities")

a) Write **TWO** inequalities that describe this situation. Let the horizontal axis represent "***b***" – the pounds of roast beef. Let the vertical axis represent "***c***" – the pounds of chicken.



b) Sketch a graph of the boundary lines and shade the region of the graph that shows the possible solutions for total money raised.

c) **Shade your solution set** and **LABEL BOTH AXES accordingly**.

d) Use the TEST POINTS method to confirm your solution.

this problem adapted from the Pearson/Discovery Video Tutor Lesson "Using a system of linear inequalities"