Algebra 1R – Mr. Bo
Unit 6+7 – Day 5 Notes

Name:_____
Date:_____

Systems of Linear Inequalities

Problem 1

Consider the system of inequalities: $\begin{cases} x + y > 1 \\ -x + y \leq 3 \end{cases}$

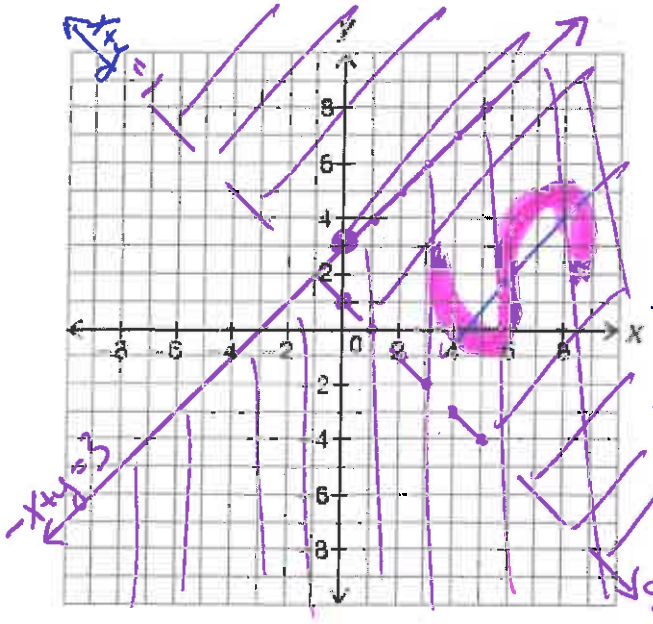
a. How do you determine if you should use a solid line or dashed line? Explain.

using the inequality symbol.
$>$ means use a dashed line.
$\leq$ means use a solid line.

b. How do you know which direction to shade? Explain.

use the point (0,0).
Plug 0 in for x and y to determine if it makes a true or false statement. If true shade to include (0,0) if false, shade to not include (0,0)

c. Graph the system of inequalities on the grid below. Mark the solution with an **S**.



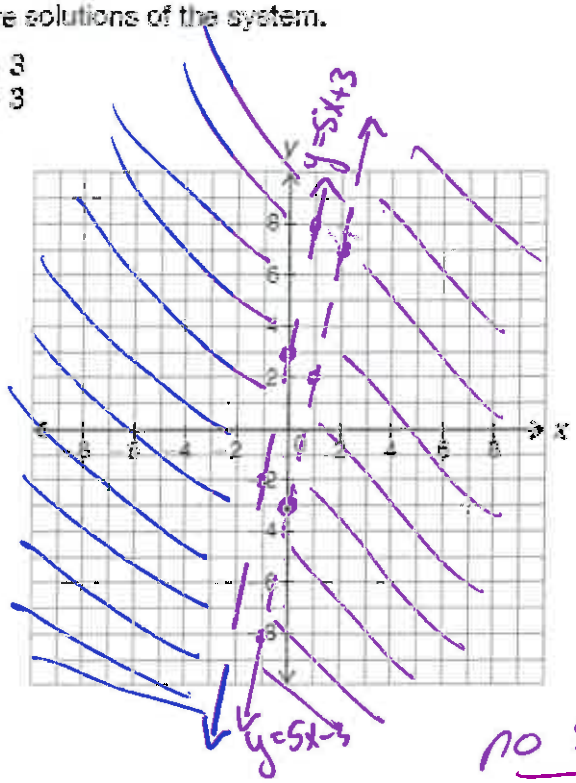
$x+y=1$
$y=-x+1$
$m=-\frac{1}{1}$
$b=1$
Dashed
$0+0>1$
$0>1$
false
Shade away from (0,0)

$-x+y=3$
$y=x+3$
$m=\frac{1}{1}$
$b=3$
Solid
$-0+0\leq 3$
$0\leq 3$
true
Shade towards (0,0)

Problem 2

Solve each system of linear inequalities by graphing the solution set. Then identify two points that are solutions of the system.

a. $\begin{cases} y > 5x + 3 \\ y < 5x - 3 \end{cases}$

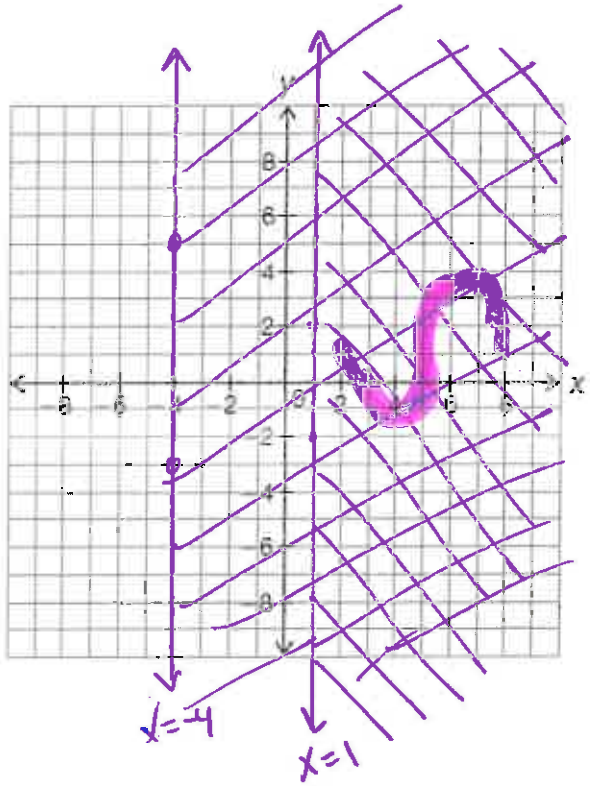


$y = 5x + 3$
Dashed
$m = \frac{5}{1}$
$b = 3$
$0 > 5(0) + 3$
$0 > 3$
false
"Shade away"

$y = 5x - 3$
Dashed
$m = \frac{5}{1}$
$b = -3$
$0 < 5(0) - 3$
$0 < -3$
false
"Shade away"

no solution

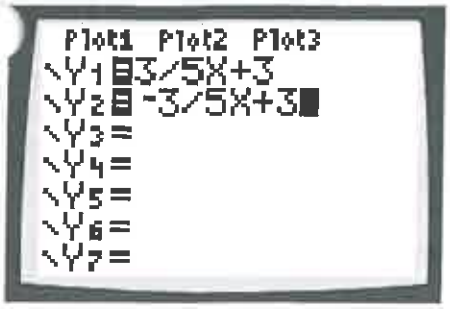
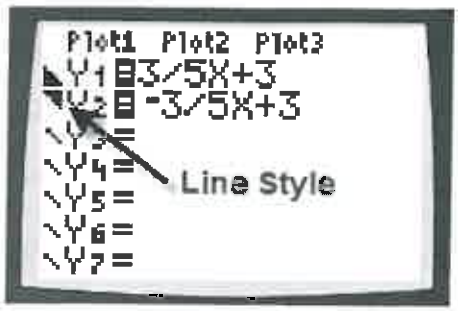
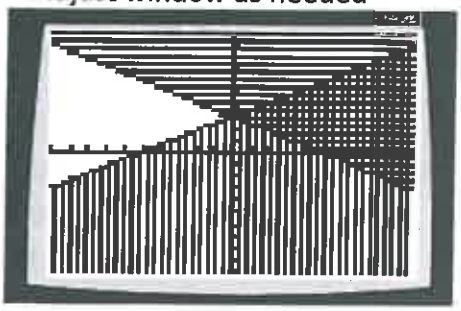
b. $\begin{cases} x \geq -4 \\ x \geq 1 \end{cases}$



$x = -4$
Solid
$m =$ und.
$b =$ none
$0 \geq -4$
true
Shade towards (0,0)

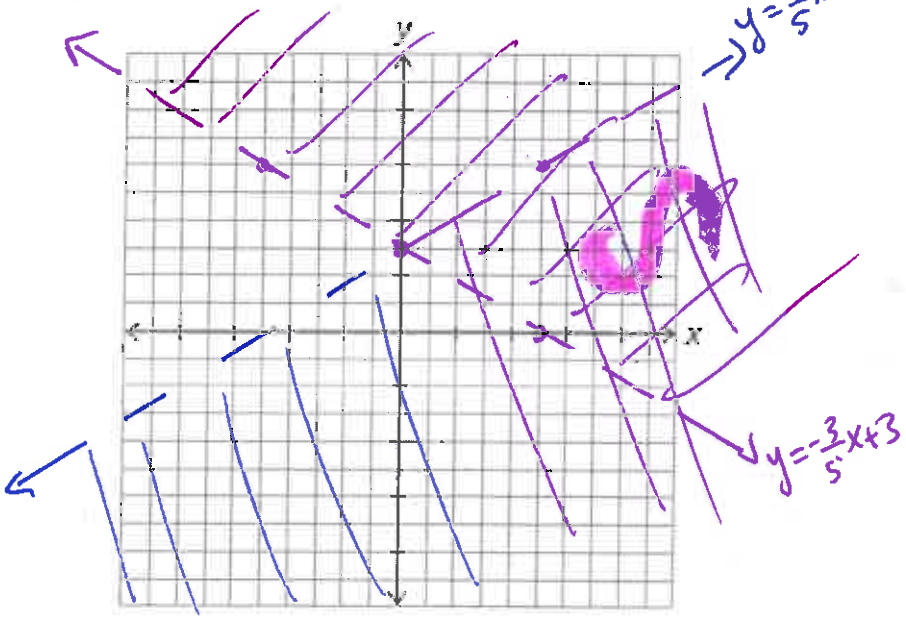
$x = 1$
Solid
$m =$ und.
$b =$ none
$0 \geq 1$
false
Shade away.

Using a Graphing Calculator

1. Enter in **Y=**	2. Change the line style.	3. Graph – Adjust window as needed
		
Remember to solve for the y-value before entering the inequalities.	When choosing the inequality symbol, think about the half-plane you must shade.	

Solve each system of linear inequalities using your graphing calculator. Graph each system then identify two points that are solutions to the system on the grid shown.

a. $\begin{cases} y < \frac{3}{5}x + 3 \\ y > -\frac{3}{5}x + 3 \end{cases}$ Dashed. Dashed.



Whitewater Rafting

Chase is an experienced whitewater rafter who guides groups of adults and children out on the water for amazing adventures. The super-raft he uses can hold 800 pounds of weight. Any weight greater than 800 pounds will cause the raft to sink, hit more rocks, and maneuver more slowly.

1. Chase estimates the weight of each adult as approximately 200 pounds and the weight of each child under age sixteen as approximately 100 pounds. Chase charges adults $75 and children under age sixteen $50 to ride down the river with him. His goal is to earn at least $150 each rafting trip.

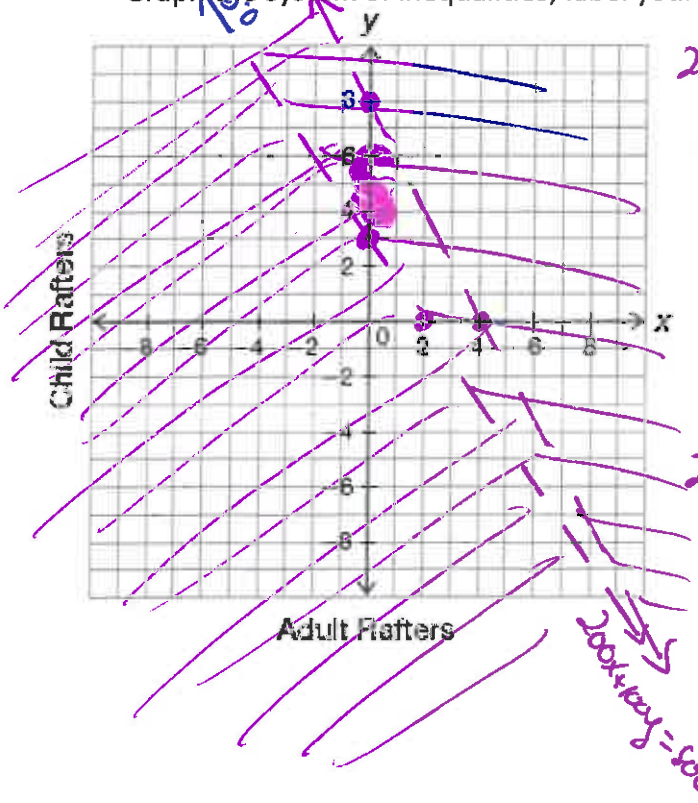
Write an inequality to represent the most weight Chase can carry in terms of rafters. Define your variables. x = # of adults, y = # kids $\quad 200x + 100y < 800$

Write an inequality to represent the least amount of money Chase wants to collect for each rafting trip. $75x + 50y \geq 150$

Write a system of inequalities to represent the maximum weight of the raft and the minimum amount of money Chase wants to earn per trip.

$$200x + 100y < 800$$
$$75x + 50y \geq 150$$

Graph the system of inequalities; label your solution with a ***S***.



$200x + 100y = 800$

$\frac{100y}{100} = \frac{-200x}{100} + \frac{800}{100}$

$y = -2x + 8$

Dashed

$200(0) + 100(0) < 800$

$0 + 0 < 800$

$0 < 800$

true

Shade towards (0,0)

$75x + 50y = 150$

$50y = -75x + 150$

$y = -\frac{75}{50}x + \frac{150}{50}$

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

Dashed

$75(0) + 50(0) \geq 150$

$0 \geq 150$

false

Shade away.