Name: Key

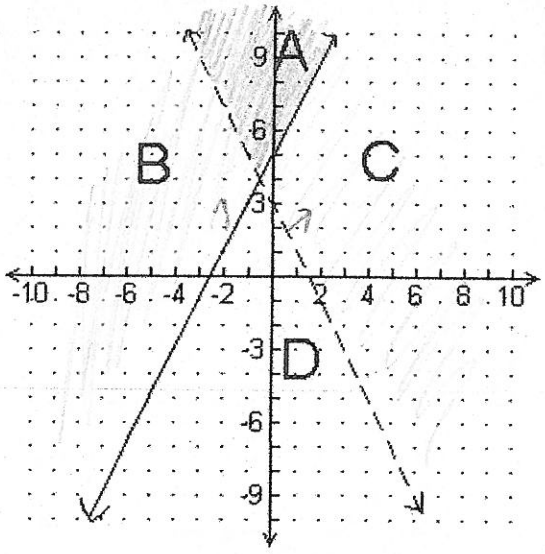
: Graphing Systems of Inequalities

For the system of linear inequalities below, state whether the indicated region of the coordinate plane is a solution of the system, of one inequality or of neither inequality. If the region is a solution to only one inequality, state which inequality.

$\begin{cases} y > -2x+3 \\ 2x - y \leq -5 \end{cases}$

$y \geq 2x+5$

1. A
2. B
3. C
4. D



A 1. Both

B 2. one $2x-y \leq -5$

C 3. One $y > -2x+3$

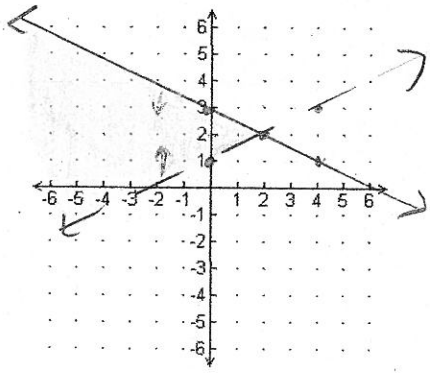
D 4. None

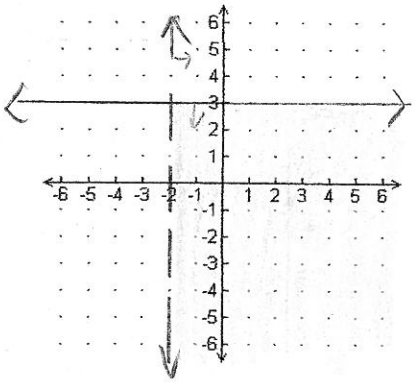
Solve each system of inequalities by graphing.

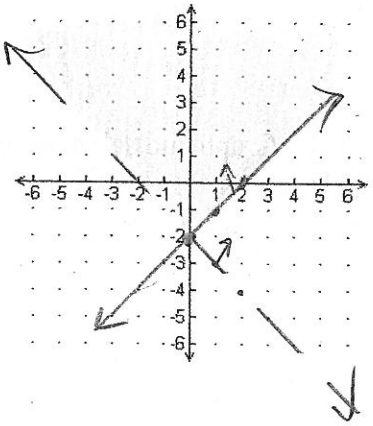
5. $\begin{cases} x-2y<-2 \\ x+2y \leq 6 \end{cases}$ $y > \frac{1}{2}x+1$ $y \leq -\frac{1}{2}x+3$

6. $\begin{cases} x>-2 \\ y \leq 3 \end{cases}$

7. $\begin{cases} x-y \leq 2 \\ x+y>-2 \end{cases}$ $y \geq x-2$ $y > -x-2$







(over)

8. Sarah takes 3 minutes per page to read a novel and 5 minutes per page to read an architecture book. She wants to read at least 50 pages each night, read something from each book, and can spend at most 180 minutes reading.

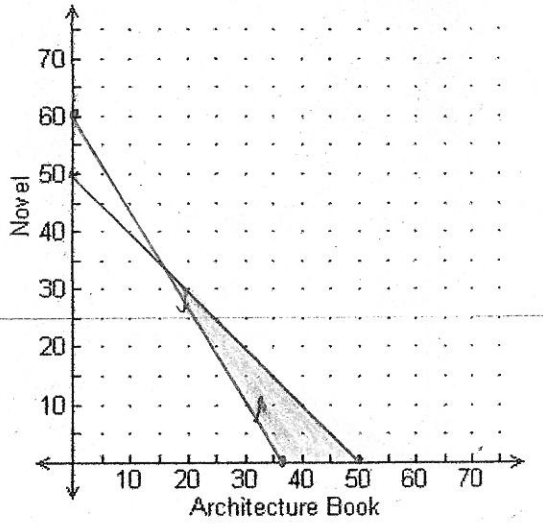
Y = pages of novel
X = pages of architecture

a. Write a system of linear inequalities that models the situation.

8a. $\begin{cases} 5x + 3y \leq 180 \\ x + y \geq 50 \end{cases}$

(36, 0) (0, 60)

b. Graph the system.



c. How could she split up her time? Find 2 possible solutions. 8c. 50 pages

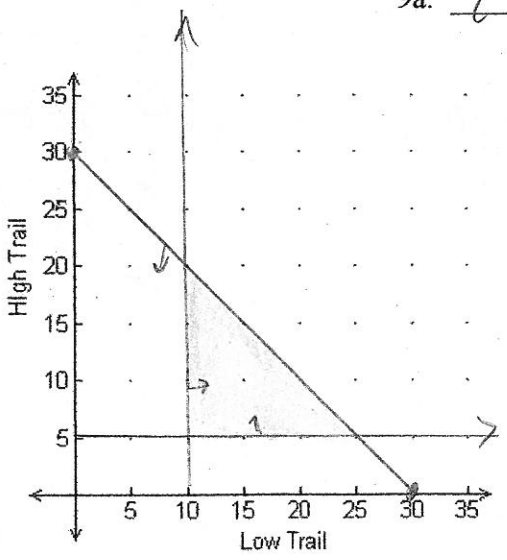
9. A camp counselor needs no more than 30 campers to sign up for two mountain hikes. The counselor needs at least 10 campers on the low trail and at least 5 campers on the high trail.

X = campers on low trail
Y = campers on high trail

a. Write a system of linear inequalities that models the situation.

9a. $\begin{cases} x + y \leq 30 \\ x \geq 10 \\ y \geq 5 \end{cases}$

b. Graph and solve the system.



Systems of Inequalities
Word Problems

Name: Key

2. Alyssa plays soccer and baseball. She burns 400 calories/h playing soccer and 50 calories/h playing baseball. Each week she is willing to spend ***at most*** 20 h exercising and wishes to burn ***at least*** 4000 calories.

a) Define variables x and y for this problem.

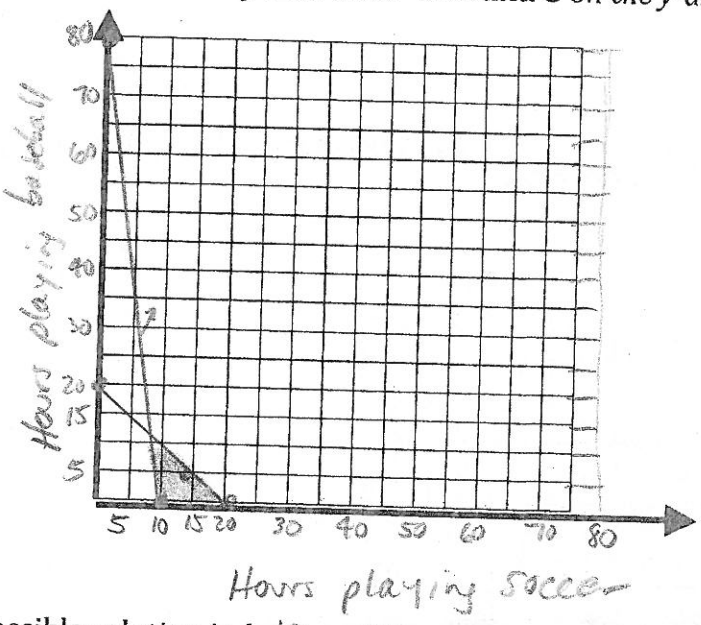
Let x represent X = hours playing soccer
Let y represent y = hours playing baseball

b) Write a system of inequalities to represent the constraints in this problem.

$$\begin{cases} x + y \leq 20 \\ 400x + 50y \geq 4000 \end{cases}$$

(0, 20) (20, 0)
(0, 80) (10, 0)

c) Draw a graph to show the time Alyssa could spend on each activity in one week.
Label the axis. Use a scale of 2 on the x- axis and 5 on the y-axis



One possible solution is (10 , 5)
Show that this works in <u>both</u> inequations

$10 + 5 \leq 20$
$15 \leq 20$

$400(10) + 50(5) \geq 4000$
$4010 + 250 \geq 4000$
$4250 \geq 4000$

Systems of Inequalities
Word Problems

Name: _____

1. A company makes backpacks and briefcases. Daily output ***cannot exceed*** a total of 40 backpacks and briefcases. A ***maximum*** of 20 backpacks can be made in one day. The ***maximum*** daily output of briefcases is 30.

a) Define variables x and y for this problem.

Let x represent # of backpacks
Let y represent # of briefcases

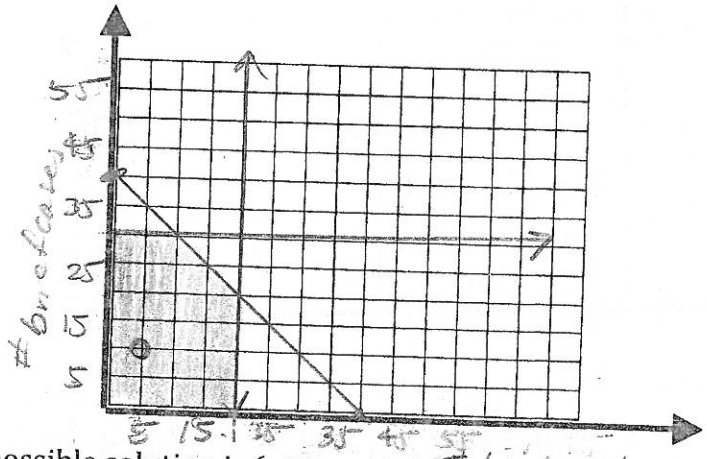
b) State the constraints given in this problem. Write an inequality for each constraint.

$$\begin{cases} x + y \leq 40 \\ x \leq 20 \\ y \leq 30 \end{cases}$$

c) What implicit constraints exist for the variables? Write an inequality for each implicit constraint.

$x \geq 0$
$y \geq 0$

d) Draw a graph that shows the possible numbers of bags that can be made in 1 day.
Label the axis. Use a scale of* 5 *on both axes.



One possible solution is (5 , 10)
Show that this works in all 3 inequations

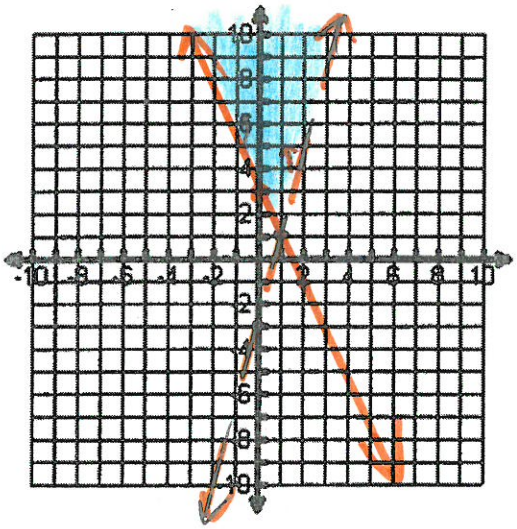
✓ $5 + 10 \leq 40$ ✓ $5 \leq 20$ ✓ $10 \leq 30$
$15 \leq 40$

Extra Practice on Solving Systems of Linear Inequalities

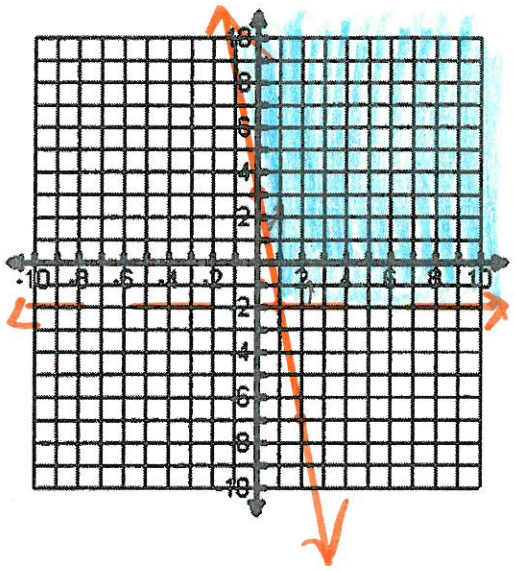
Name Key Class Period

Graph the system of linear inequalities.

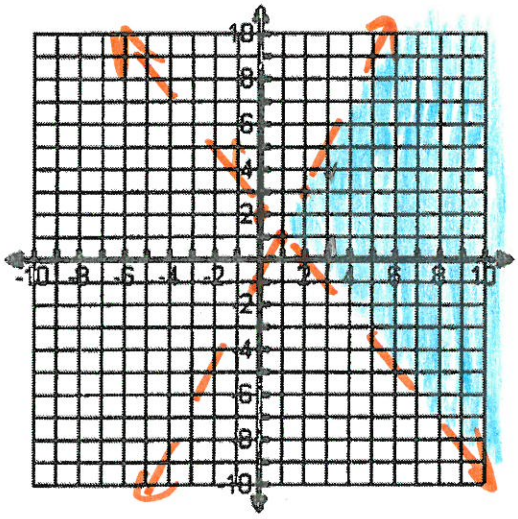
1. $y > 4x - 3$
   $y \geq -2x + 3$



2. $y \geq -5x + 3$
   $y > -2$



3. $x + y > 2$ $y > -x + 2$
   $2x - y > 1$ $y < 2x - 1$



4. $3x + y \geq -3$ $y \geq -3x - 3$
   $x + 2y \leq 4$ $y \leq -\frac{1}{2}x + 2$