Name _____ **Date** _____ **Period** _____

System of Linear Inequality Review Problems

I can graph the solutions of a linear inequality.

1. Rewrite the equation in slope intercept form.

$4x - 3y = 7$

$-4x \quad -4x$

$-3y = -4x + 7$

$y = \frac{4}{3}x - \frac{7}{3}$

$m =$ $\frac{4}{3}$ $b =$ $\frac{-7}{3}$ $y-intercept$ $(0, \frac{-7}{3})$

2. Rewrite the inequality into slope-intercept form.

$5x - 2y \geq 10$

$-2y \geq -5x + 10$

$y \leq \frac{5}{2}x - 5$

↑ switch (divide by -2)

$m =$ $\frac{5}{2}$ $b =$ -5 $y-intercept$ $(0, -5)$

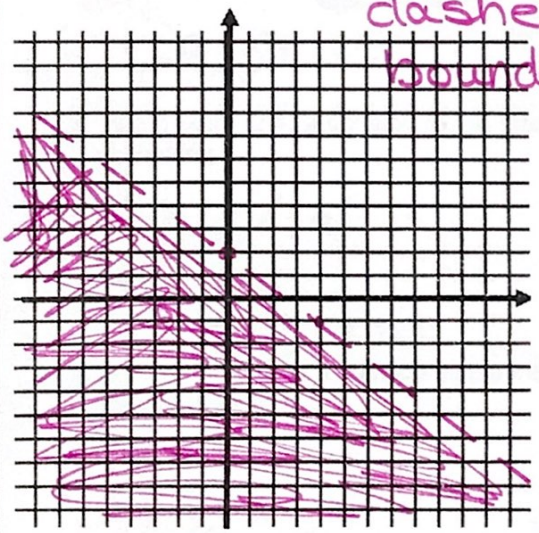
3. Graph the solutions to the inequality.

$3x + 4y < 8$

$4y < -3x + 8$

$y < -\frac{3}{4}x + 2$

be sure dashed boundary



4. Using the graph, check the possible solutions:

- ☑ (0, -2)
- ☑ (0, 0)
- ☐ (6, 0)
- ☑ (0, -4)
- ☑ (-10, 0)

5. Define the solution of a two variable, linear inequality.

The values of x and y coordinates (points) that make the inequality true.

6. How many solutions are there to a linear, two variable inequality? Explain your answer.

Infinite. All the points in the shaded region (solution) or on the boundary line if equal is included (≥ or ≤)

7. How do you determine if the boundary line is dashed or solid?

If an inequality sign has an = ($\geq \leq$) it is solid. If there is not an = it is dashed.

8. How do you determine where you should shade to show your solutions?

Test a point. If the point makes the inequality true, shade to include it. If not true, shade the opposite side.

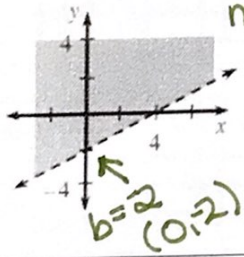
9. Describe what the solution to a system of inequalities in two variables represents.

The coordinate pairs (points) that make both inequalities true.

10. What are the possible number of solutions to a system of inequalities in two variables. Explain your answer.

infinite or no solutions. Two parallel lines may have no intersection of solutions

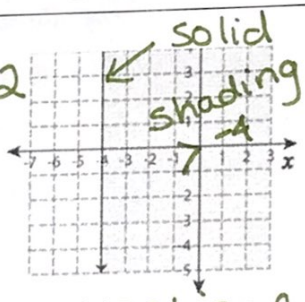
11. Write the inequality for the graph of solutions.



$m = \frac{2}{4} = \frac{1}{2}$ $y > \frac{1}{2}x - 2$

dashed boundary

$b = -2$ $(0, -2)$



solid

shading

$x \geq -4$

vertical line $x =$

12. Is the point (2,4) a solution to the inequality $y \geq 2x - 1$? Show your calculations and explain your reasoning.

$4 \geq 2(2) - 1$

$4 \geq 4 - 1$

$4 \geq 3$ True

Since the inequality is true, (2,4) is a solution. It is in the shaded region

13. Is the point (-1,-1) a solution to the inequality $y < -2x - 3$? Show your calculations and explain your reasoning.

$-1 < -2(-1) - 3$

$-1 < 2 - 3$

$-1 < -1$ False

No, it is not a solution. It is not in the shaded region. It is on the dashed line.

14. Is the point (4,-1) a solution to the system? Show your calculations and explain your reasoning.

$y \leq 2x - 1$

$y > -x + 3$

$y \leq 2x - 1$

$-1 \leq 2(4) - 1$

$\leq 8 - 1$

$-1 \leq 7$

Yes

$y > -x + 3$

$-1 > -(4) + 3$

$-1 > -1$

no

It is not a solution to the system. It is a solution only to the first inequality

I can graph a system of linear inequalities.

15. Graph the system of linear inequalities.

Solution

$-2x + 6y \geq 24$

$5x + 2y < -16$

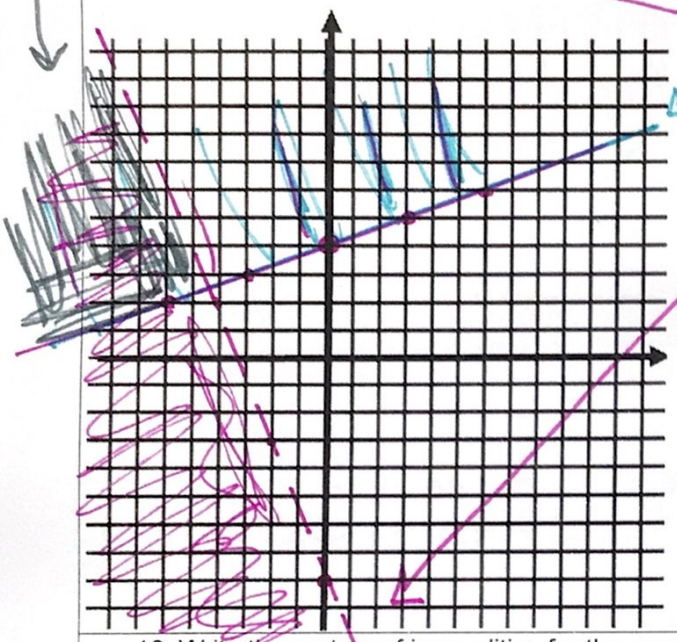
$6y \geq 2x + 24$

$y \geq \frac{2}{6}x + \frac{24}{6}$

$y \geq \frac{1}{3}x + 4$

$2y < -5x - 16$

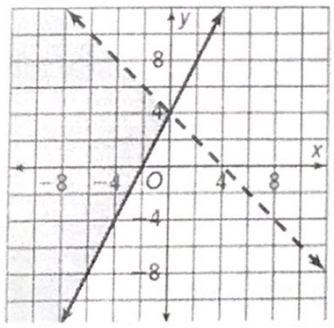
$y < \frac{-5}{2}x - 8$



Using the graph, check the possible solutions:

- ☑ (-6, 2)
- ☐ (0, -8) NO
- ☐ (0, 0) NO
- ☐ (0, 4)
- ☑ (-10,10)

16. Write the system of inequalities for the graph of the solutions.



$y \geq 2x + 4$

$y < -1x + 4$

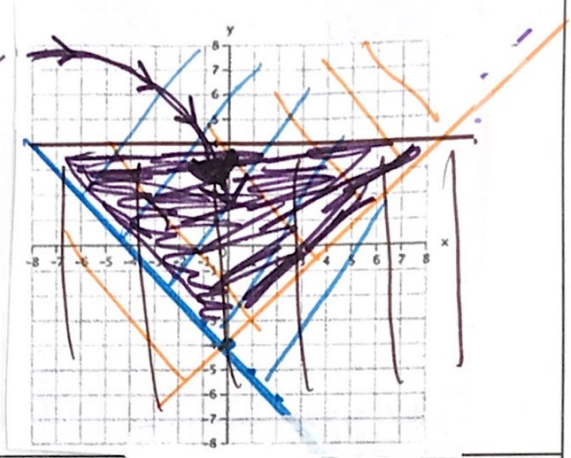
17. Graph the solutions of the system of inequalities.

$y \le 4$

$y \ge -x - 4$

$y \ge x - 4$

Solution in dark shaded region



I can create an inequality and use it to solve real world problems.

18 A radio station is giving away tickets to a concert. They plan to give away tickets for seats that cost $70 and $100. They want to give away at least 8 tickets. The total cost of all the tickets they give away can be no more than $850. What is a possible number of $70 tickets and $100 tickets the radio station can give away?

a) Write "Let" statements.

x: number of $70 tickets

y: number of $100 tickets

b) Write a system of inequalities that represents the situation.

$x + y \ge 8$

$70x + 100y \le 850$

$100y \le -70x + 850$

$x \ge 0$

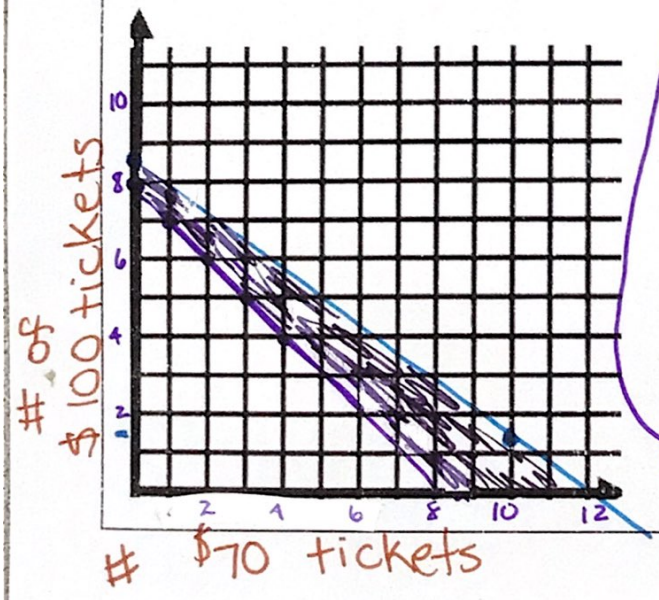
$y \ge 0$

$y \ge -x + 8$

$y \le \frac{-7}{10}x + \frac{17}{2}$

$8\frac{1}{2}$

c) Graph the system. (Remember to label your axes.)



d) Write one possible solution to the problem.

(6, 3)

6 $70 tickets 3 $100 tickets

e) Why is the first quadrant only needed for this situation?

$x \ge 0$

$y \ge 0$

We can not sell negative number of tickets.

f) What two inequalities are needed in b) that limits the solutions to the first quadrant?

$x \ge 0$

$y \ge 0$