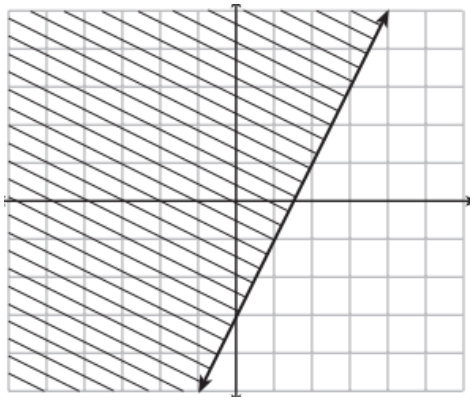
Name: _____ Class: _____

Systems of Equations Day Two: Systems of Inequalities

Question 1

The graph of inequality is shown below.



(a) Write the inequality represented by the graph

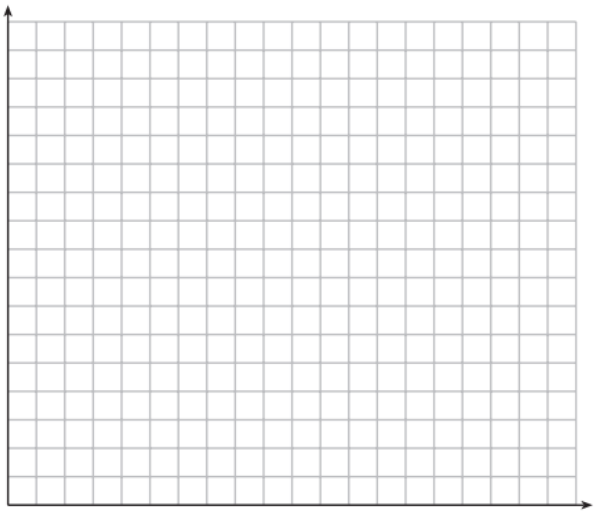
(b) On the same set of axes, graph the inequality $2x + y > 1$.

(c) Todd thinks the point $(1, 0)$ is in the solution set for this system of inequalities. Do you agree? Explain.

Question 2

A small family store must sell at least \$1250 worth of tablets (x-value) and peripherals (y-values) per day. Each tablet costs \$250 and each peripheral costs \$25. The store can ship a maximum of 14 items per day.

On the set of axes below, graph a system of inequalities that models these constraints.



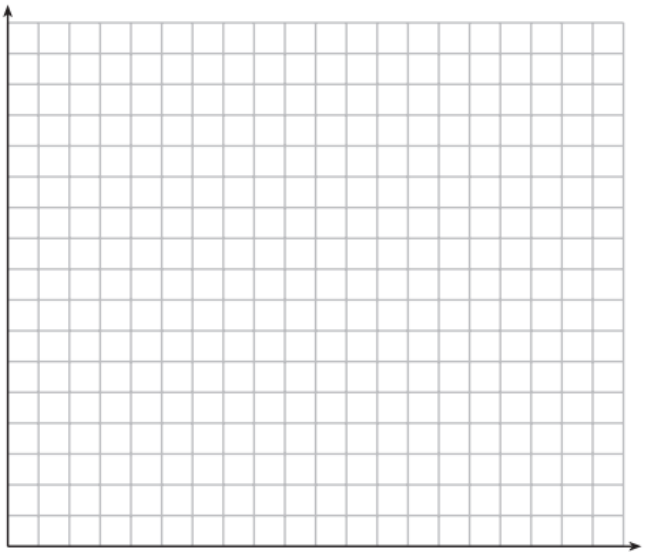
Determine a combination of tablets and peripherals that would allow the family store to meet all of the constraints. Explain how you obtained your answer.

Question 3

Troy is working two jobs, one as a teacher and one as a website designer. He can work at most 50 hours per week and makes $35 per hour as a teacher and $75 an hour as a website designer. He wants to make at least $2350 per week but also wants to work at least 10 hours per week as a teacher. Let x represent the hours he works as a teacher and let y represent the hours he works as a website designer.

(a) Create a three-part system of inequalities that models this scenario

(b) Create a graph of the system using the space below. Label each with its inequality.



(c) Find the maximum number of hours that Troy can work as a teacher. Use the graph to justify your answer.

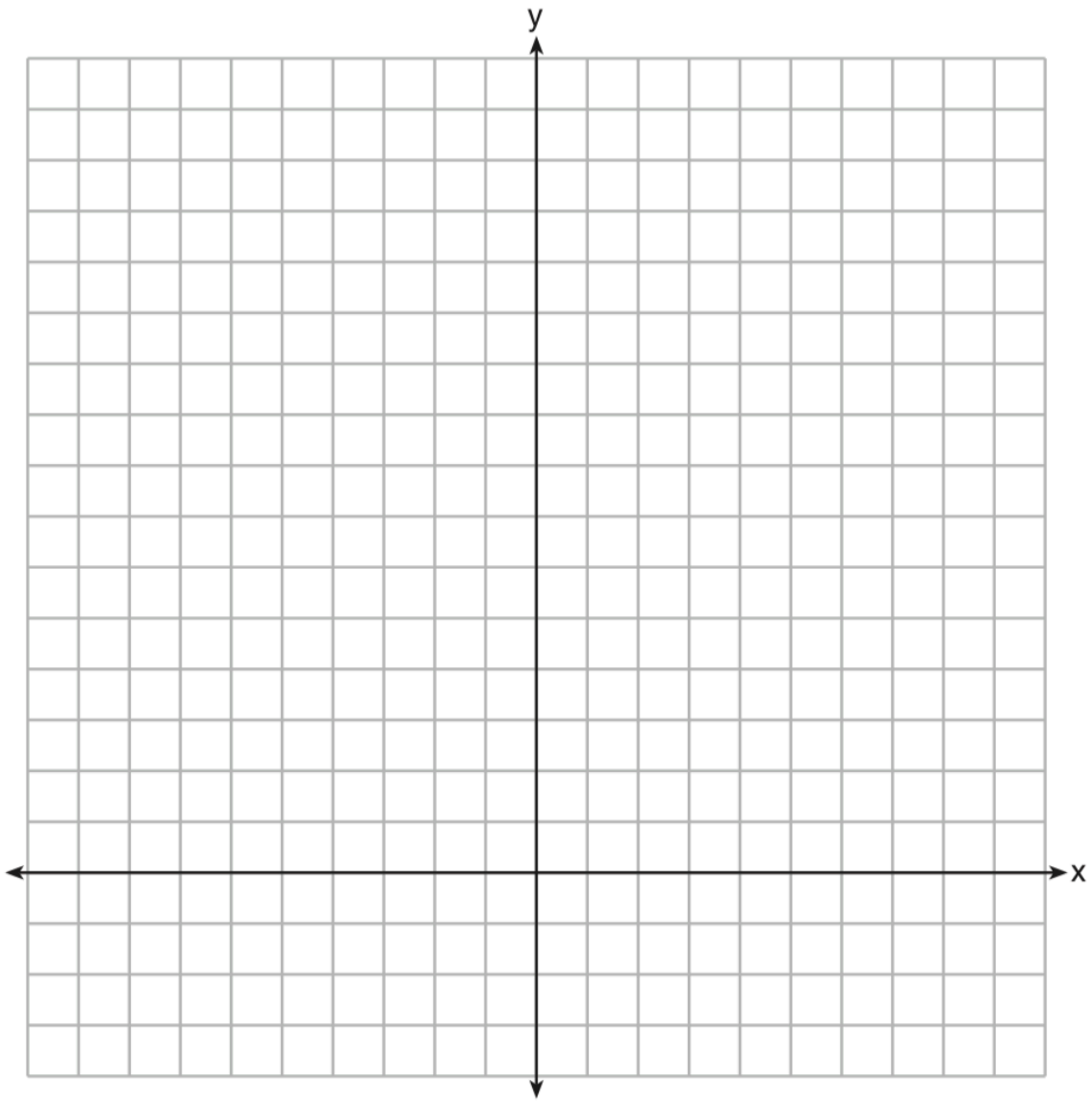
Question 4

A drama club is selling tickets to the spring musical. The auditorium holds 200 people. Tickets cost $12 at the door and $8.50 if purchased in advance. The drama club has a goal of selling at least $1000 worth of tickets to Saturday's show. Write a system of inequalities that can be used to model this scenario. If 50 tickets are sold in advance, what is the minimum number of tickets that must be sold at the door so that the club meets its goal? Justify your answer.

Question 5

The sum of two numbers, x and y, is more than 8. When you double x and add it to y, the sum is less than 14.

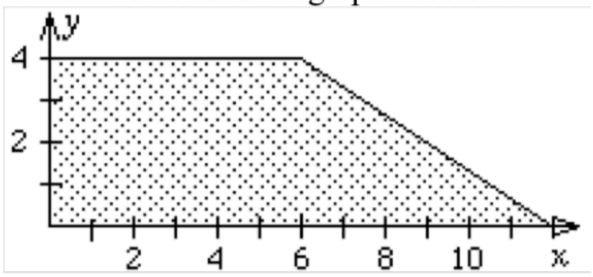
Graph the inequalities that represent this scenario on the set of axes below.



Kai says that the point (6,2) is a solution to this system. Determine if he is correct and explain your reasoning.

Question 6

Which restrictions are graphed below?



[A] $y \geq 0$; $0 \leq x \leq 4$; $2x + 3y \leq 24$

[B] $x \geq 0$; $0 \leq y \leq 4$; $2x + 3y \leq 24$

[C] $x \leq 0$; $y \leq 0$; $x + y \leq 4$; $3x + 2y \leq 24$

[D] $x \geq 0$; $0 \leq y \leq 4$; $3x - 2y \leq 24$

Question 7

A company makes two chemicals: Type I and Type II. Due to storage problems, a maximum of 100 pounds of Type I and 150 pounds of Type II can be mixed and packaged each year. One pound of Type I takes 60 hours to mix and 70 hours to package; one pound of Type II takes 40 hours to mix and 40 hours to package. The mixing department has at most 7200 hours available each year, and packaging has at most 7800 hours available. If the profit for one pound of Type I is $62 and for one pound of Type II is $40, what is the maximum profit possible each year?

[A] $7338.00 [B] $7178.00

[C] $7484.00 [D] $7320.00

Question 8

Gretchen has $50 that she can spend at the fair. Ride tickets cost $1.25 each and game tickets cost $2 each. She wants to go on a minimum of 10 rides and play at least 12 games.

Which system of inequalities represents this situation when r is the number of ride tickets purchased and g is the number of game tickets purchased?

(1) $1.25r + 2g < 50$
$r \leq 10$
$g > 12$

(2) $1.25r + 2g \leq 50$
$r \geq 10$
$g \geq 12$

(3) $1.25r + 2g \leq 50$
$r \geq 10$
$g > 12$

(4) $1.25r + 2g < 50$
$r \leq 10$
$g \geq 12$