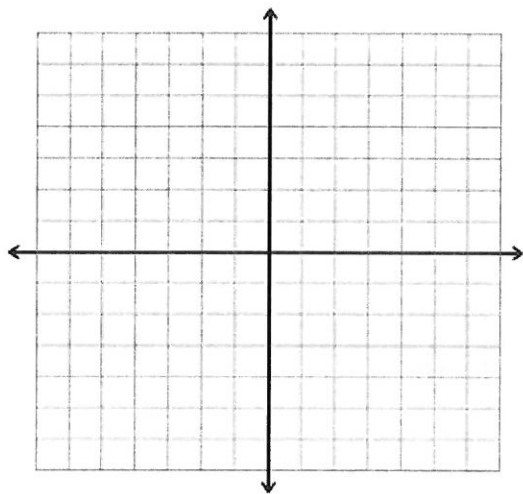


Pre-Calculus 1
Linear Programming Review

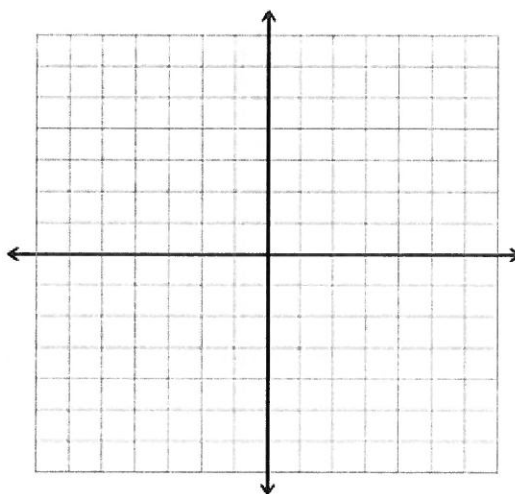
Name _____

1. Solve the following systems of inequalities by graphing.

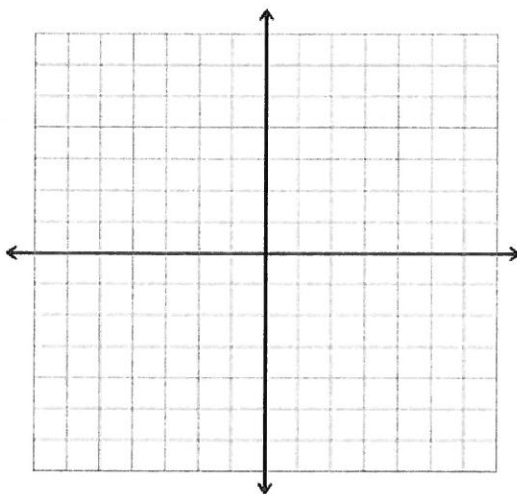
a.
$$\begin{cases} y > x + 2 \\ y \leq -x + 1 \end{cases}$$



b.
$$\begin{cases} x - 2y < 3 \\ 2x + y > 8 \end{cases}$$



c.
$$\begin{cases} x \geq -4 \\ y \leq 3 \\ 3x + 2y < 10 \end{cases}$$



2. For each of the systems in #1, name one point that is a solution to the system and one point that is not a solution to the system.

a. Solution _____

b. Solution _____

c. Solution _____

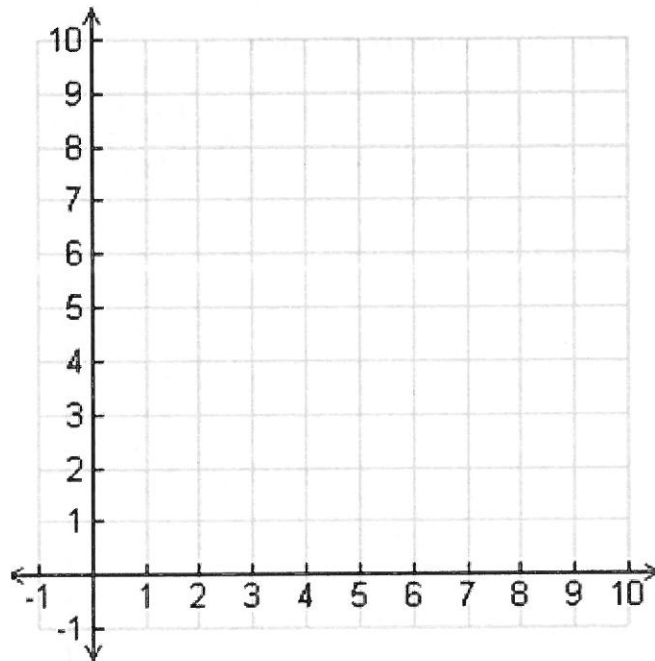
Not a solution _____

Not a solution _____

Not a solution _____

3. Graph the following system of inequalities and find the coordinates of the boundary points.

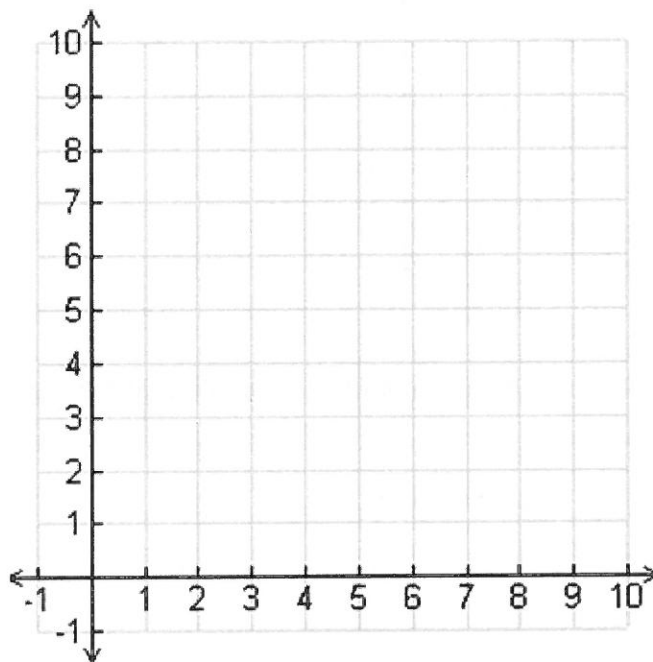
$$\begin{cases} x - y \geq 1 \\ 3x + 2y \geq 18 \\ x \geq 0 \\ y \geq 0 \end{cases}$$



Find the boundary point that minimizes $C = 4x + 7y$.

4. Graph the following system of inequalities and find the coordinates of the boundary points.

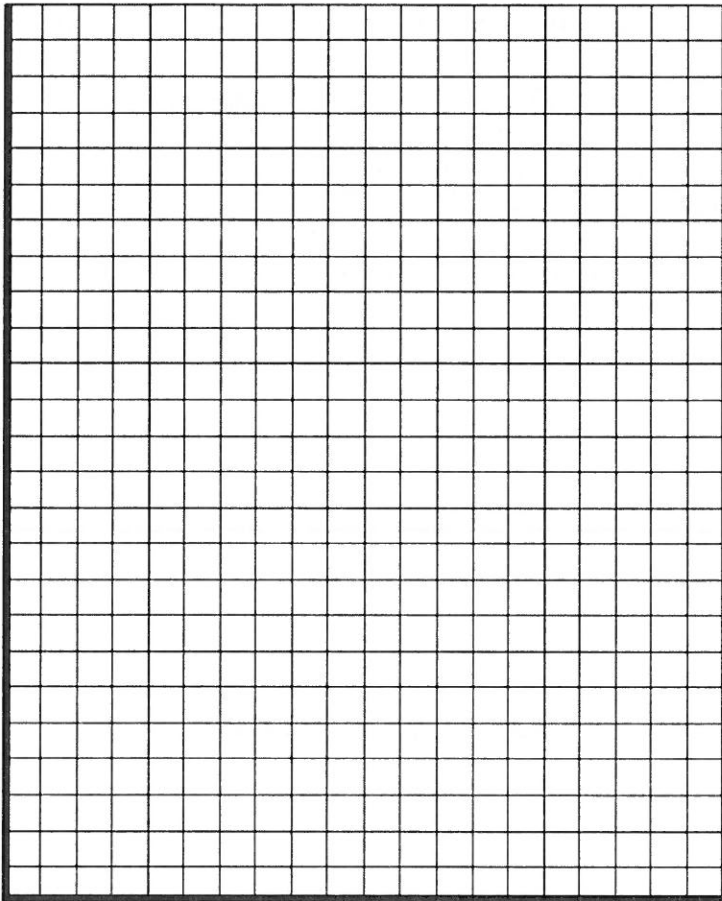
$$\begin{cases} 3x + 4y \geq 12 \\ x + 2y \leq 10 \\ x \geq 0 \\ x \leq 4 \end{cases}$$



Find the boundary point that maximizes $C = 5x + 2y$.

5. The area of a parking lot is 600 square meters. A car requires 6 square meters. A bus requires 30 square meters. The attendant can handle only 60 vehicles. If a car is charged \$2.50 and a bus \$7.50, how many of each should be accepted to maximize income?

	Car (x)	Bus (y)	Combined
Area	6	30	600
Quantity	x	y	60
Profit (\$)	\$2.50	\$7.50	



a. Write your constraints

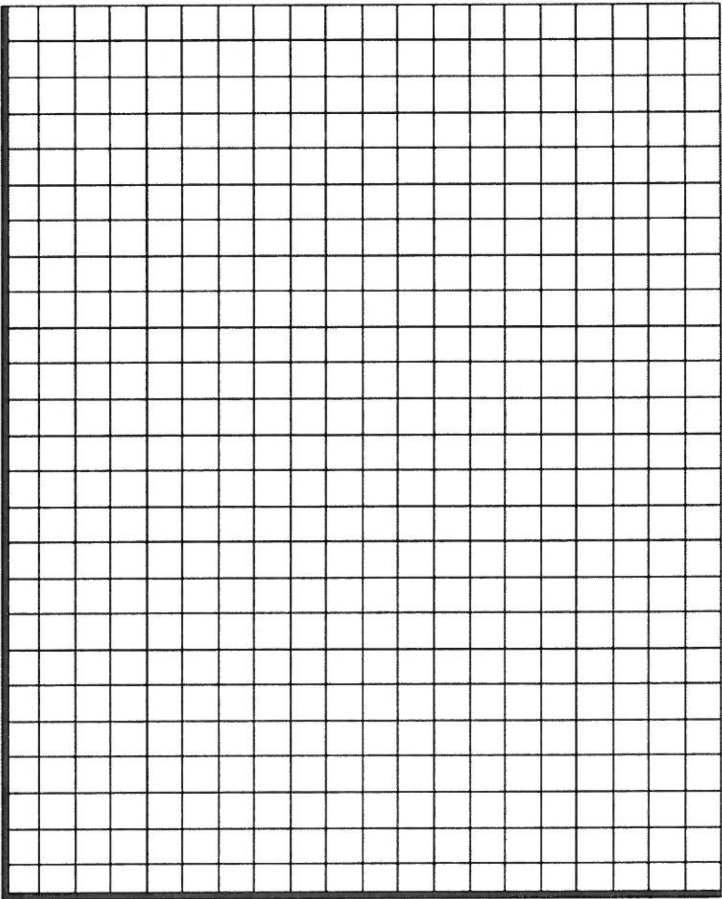
b. Graph the system and find the boundary points.

c. Write the expression (objective function) to be maximized or minimized.

d. Determine which boundary point maximized/minimized your objective function.

6. Toys-A-Go makes toys at Plant A and Plant B. Plant A needs to make a minimum of 1000 toy dump trucks and fire engines. Plant B needs to make a minimum of 800 toy dump trucks and fire engines. Plant A can make 10 toy dump trucks and 5 toy fire engines per hour. Plant B can produce 5 toy dump trucks and 15 toy fire engines per hour. It costs \$30 per hour to produce toy dump trucks and \$35 per hour to produce toy fire engines. How many hours should be spent on each toy in order to minimize cost? What is the minimum cost?

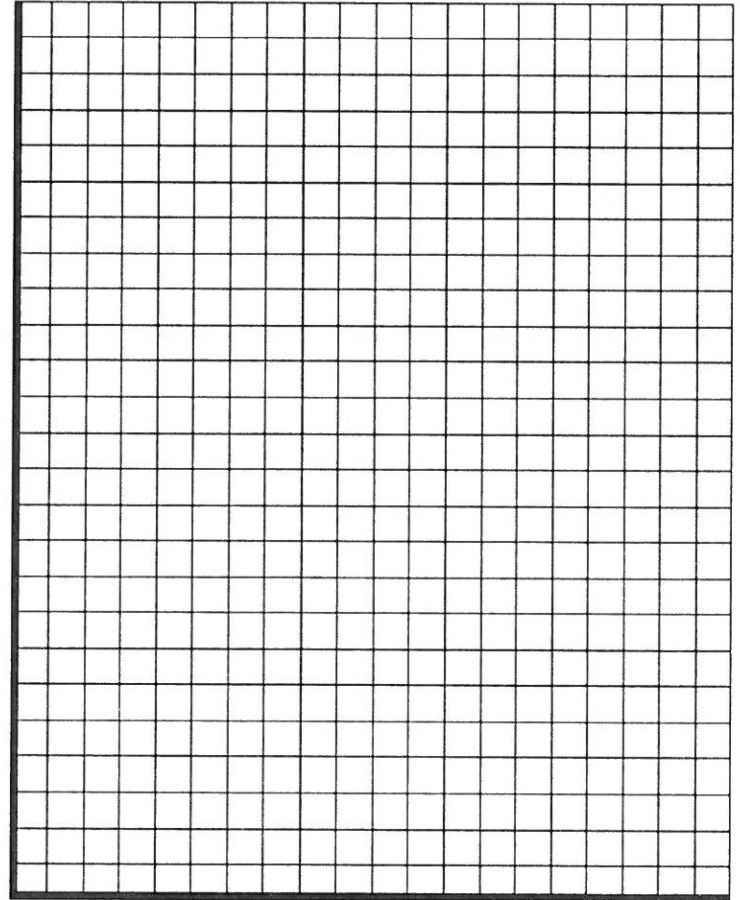
	Dump (x)	Fire (y)	Combined
Plant A	10	5	1000
Plant B	5	15	800
Cost	\$30	\$35	



- Write your constraints
- Graph the system and find the boundary points.
- Write the expression (objective function) to be maximized or minimized.
- Determine which boundary point maximized/minimized your objective function.

7. A farmer has a field of 70 acres in which he plants potatoes and corn. The seed for potatoes costs \$20 per acre, the seed for corn costs \$60 per acre and the farmer has set aside \$3000 to spend on seed. The profit per acre of potatoes is \$150 and the profit per acre of corn is \$50. How much of each crop should the farmer plant to maximize profits?

a. Write your constraints



b. Graph the system and find the boundary points.

c. Write the expression (objective function) to be maximized or minimized.

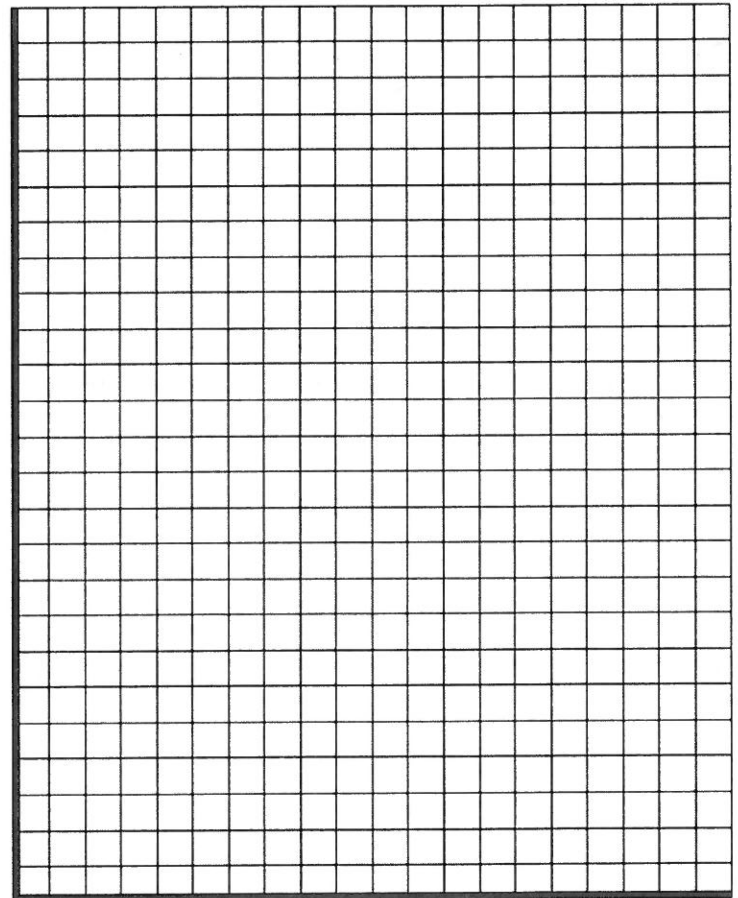
d. Determine which boundary point maximized/minimized your objective function.

8. Biggie Pizza makes gourmet frozen pizzas to sell to supermarket chains. The company makes two deluxe pizzas: one vegetarian and the other with meat.

- Each vegetarian pizza requires 12 minutes of labor and each meat pizza requires 6 minutes of labor. The plant has at most 3,600 minutes of labor available each day.
- The plant freezer can handle at most 500 pizzas per day.
- The vegetarian pizza is not quite as popular as meat pizza, so the company can sell at most 200 vegetarian pizzas each day.
- Sale of each vegetarian pizza earns Biggie's \$3 profit. Each meat pizza earns \$2 profit.

How many of each pizza should Biggie's produce to maximize profit? What is that maximum profit?

a. Write your constraints



b. Graph the system and find the boundary points.

c. Write the expression (objective function) to be maximized or minimized.

d. Determine which boundary point maximized/minimized your objective function.