Math 1

Linear Programming (Day 2)

SWBAT write and graph linear inequalities to maximize an objective function.

Linear Programing is a method for finding a ___________________ or ________________________ value of some quantity, given a __________________________________.

The constraints are a system in inequalities that when graphed give you a ______________________.
(It contains all the points that satisfy the constraints)

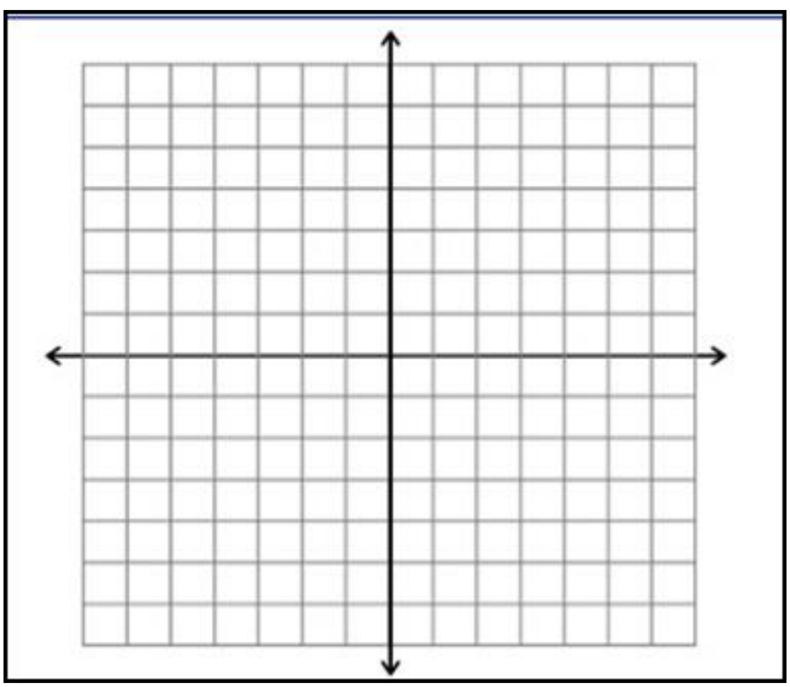
The quantity you are trying to minimize or maximize is the _____________________________.

Graph each system of constraints. Name all vertices.
The objective function is normally a ______________ or ____________ function.

Steps to Solving a Linear Programming System of Inequalities

Step 1: Graph the system of inequalities (the constraints)
Step 2: Write the coordinates of the feasible region (extreme points of the system)
Step 3: Substitute the coordinates into the objective function to determine the maximum or minimum value of the function.

Graph the following:
$x + 2y \leq 5$
$x - y \leq 2$
$x \geq 0$
$y \geq 0$
Evaluate $P = x + 3y$ at each vertex



Graph each system of constraints. Name all vertices. Then find the values of x and y that maximize or minimize the objective function.

1. $\begin{cases} y \le -x + 3 \\ y \le -\dfrac{1}{2}x + 2 \\ x \ge 0,\ y \ge 0 \end{cases}$

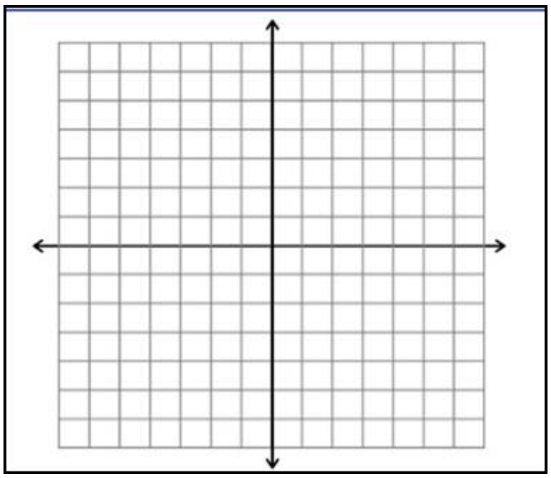
Maximum for
$P = -4x + 3y$

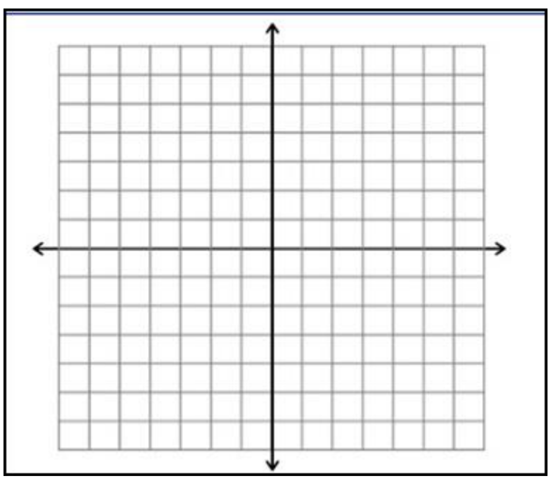
2. $\begin{cases} y \le -x + 4 \\ y \le -\dfrac{1}{3}x + 2 \\ x \ge 0,\ y \ge 0 \end{cases}$

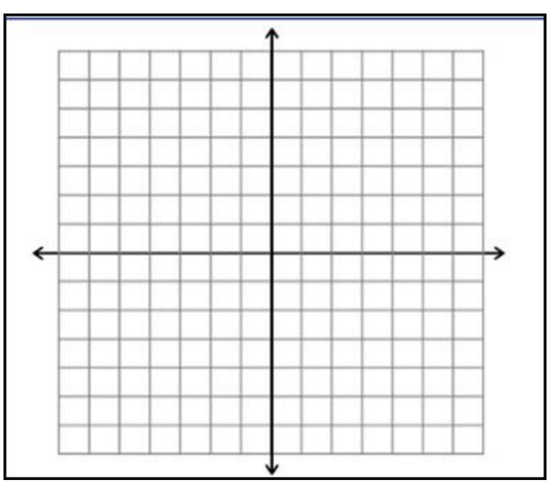
Minimum for
$P = 2x + 3y$

3. $\begin{cases} y \le \dfrac{1}{2}x + 2 \\ y \le -x + 8 \\ x \ge 2,\ y \ge 1 \end{cases}$

Maximum for
$P = x - 4y$







Graph each system of constraints. Name all vertices. Then find the values of x and y that maximize or minimize the objective function. Find the maximum or minimum value.

4. $\begin{cases} y \le -3x + 7 \\ 2y + x \le 9 \\ x \ge 0, y \ge 0 \end{cases}$

Minimum for
$P = 2x + y$

5. $\begin{cases} y - 5 \le 4x \\ y + x \le 10 \\ x \ge 0, y \ge 3 \end{cases}$

Maximum for
$P = 7x - 5y$

6. $\begin{cases} 3y \le -x + 9 \\ y + 2x \le 8 \\ x \ge 0, y \ge 0 \end{cases}$

Maximum for
$P = 4x + y$