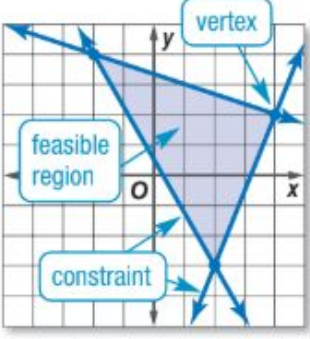


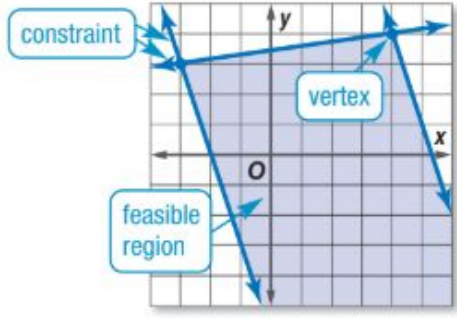
Linear Programming: a method for finding _____ or _____ values of a function over a given system of inequalities with each inequality representing a _____.

Feasible Region:

KeyConcept Feasible Regions



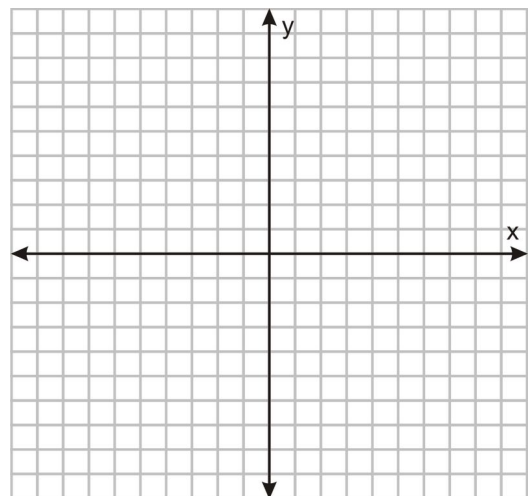
The feasible region is enclosed, or **bounded**, by the constraints. The maximum or minimum value of the related function *always* occurs at a vertex of the feasible region.



The feasible region is open and can go on forever. It is **unbounded**. Unbounded regions have either a maximum or a minimum.

- Graph the system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values for this region.

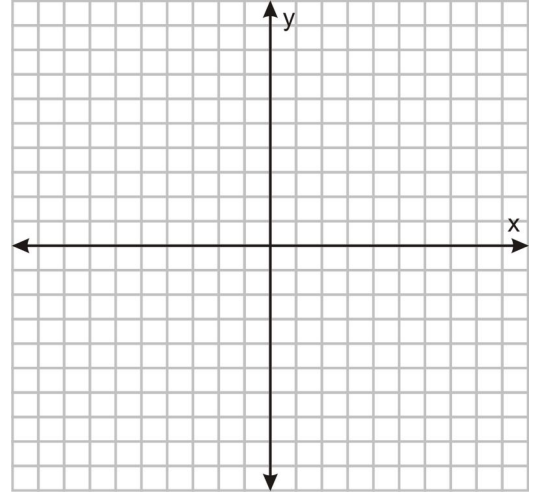
$$\begin{aligned}
 -2 &\leq x \leq 6 \\
 1 &\leq y \leq 5 \\
 y &\leq x + 3 \\
 f(x, y) &= -5x + 2y
 \end{aligned}$$



3.3 Optimization with Linear Programming
Honors Algebra 2

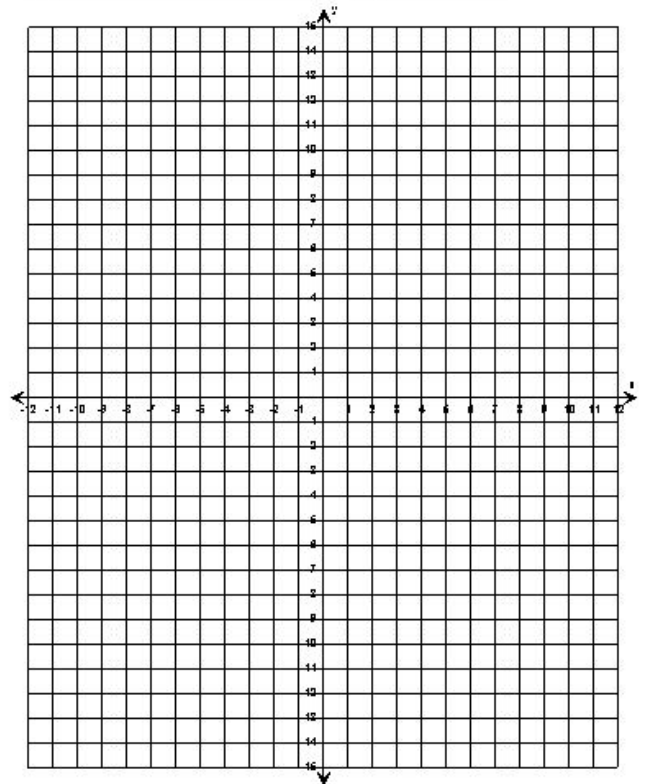
2. Graph the system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values for this region.

$$\begin{aligned} -6 &\leq y \leq -2 \\ y &\leq -x + 2 \\ y &\leq 2x + 2 \\ f(x, y) &= 6x + 4y \end{aligned}$$



3. Graph the system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values for this region.

$$\begin{aligned} y &\geq x - 9 \\ y &\leq -4x + 16 \\ y &\geq -4x - 4 \\ f(x, y) &= 10x + 7y \end{aligned}$$



4. An electronics company produces digital audio players and phones. A sign on the company bulletin board is shown.

Keeping Costs Down: We Can Do It!

Our Goal: Production per Shift			
Unit	Minimum	Maximum	Cost per Unit
audio	600	1500	\$55
phone	800	1700	\$95

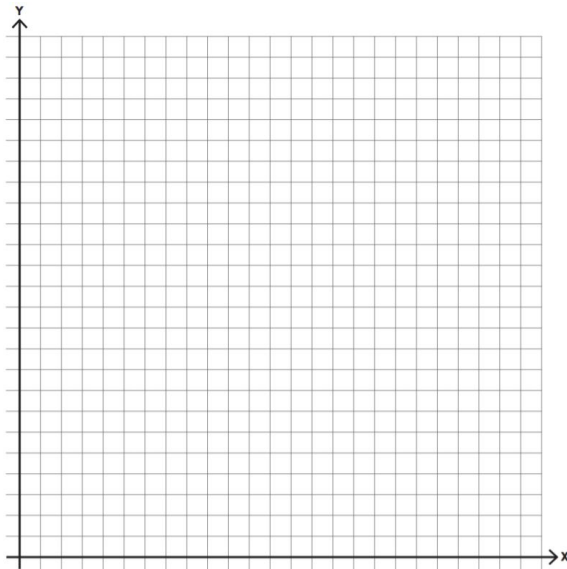
The company is experiencing limits, or constraints, on production caused by customer demand, shipping, and the productivity of their factory. A system of inequalities can be used to represent these constraints. If at least 2000 items must be produced per shift, how many of each type should be made per shift to minimize costs?

a. Variables:

b. Inequalities:

c. Graph

d. Function to be minimized:



e. Find minimum:

3.3 Optimization with Linear Programming
Honors Algebra 2

5. Each week, Mackenzie can make 10 to 25 necklaces and 15 to 40 pairs of earrings. If she earns profits of \$3 on each pair of earrings and \$5 on each necklace, and she plans to sell at least 30 pieces of jewelry, how can she maximize profits?

