

PROBLEM SET 3-4
(Linear Programming)

Graph the following system of constraints. Name all vertices. Then find the values of x and y that minimize the objective function. Find the minimum value:

1.
$$\begin{cases} 25 \leq x \leq 75 \\ y \leq 110 \\ 8x + 6y \geq 720 \end{cases}$$

Objective Function: $C = 8x + 5y$

For each of the following,

- a) **Define all variables**
 - b) **Write a system of constraints (inequalities) and the objective function**
 - c) **Graph the system**
 - d) **Find all vertices**
 - e) **Determine the values which minimize or maximize the objective function and state that value**
2. A biologist is developing two new strains of bacteria. Each sample of Type I bacteria produces four new viable bacteria and each sample of Type II bacteria produces three new viable bacteria. Altogether, at least 240 new viable bacteria must be produced. At least 30, but not more than 60, of the original samples must be Type I. Not more than 70 of the samples can be Type II. A sample of Type I costs \$5 and a sample of Type II costs \$7. How many of each should be used to minimize cost?
3. Baking a tray of corn muffins takes 4 c milk and 3 c wheat flour. A tray of bran muffins takes 2 c milk and 3 c wheat flour. A baker has 16 c milk and 15 c wheat flour. He makes \$3 profit per tray of corn muffins and \$2 profit per tray of bran muffins. How many trays of each type of muffin should the baker make to maximize his profit?