**Example 1**

Personal Mini Warehouses is planning to expand its successful Orlando business into Tampa. In doing so, the company must determine how many storage rooms of each size to build. Its objective and constraints follow:

Maximize monthly earnings = 50 X1 + 20 X2

Subject to 2 X1 + 4 X2 ≤ 400 (advertising budget available)

100 X1 + 50 X2 ≤ 8000 (square footage required)

X1 ≤ 60 (rental limit expected)

Where

X1 = number of large spaces developed

X2 = number of small spaces developed

a. Find the optimal solution

b. For the optimal solution, how much of the advertising budget is spent?

c. For the optimal solution, how much square footage will be used?

d. What would the solution change if the budget were only $300 instead of $400?

e. What would the optimal solution be if the profit on the large spaces were reduced from $50 to $45?

f. How much would earning increase if the square footage requirement were increased from 8000 to 9000?

**Example 2**

Solve the following LP formulation graphically, using the corner point method and isocost line approach:

Minimize costs = 24 X1 + 28X2

Subject to 5 X1 + 4 X2 ≤ 2000

X1 ≥ 80

X1 + X2 ≥ 300

X2 ≥ 100

X1, X2 ≥ 0