H. ALG 2

Linear Programming

Define Variables.
Write a system of inequalities.
Graph the solution set of the system of inequalities.
Find the coordinates of each vertex (corner point).
Write an expression to be maximized or minimized.
Substitute values from the vertices into the expression. (i.e. make the table)
Select the needed result (maximum or minimum).
Answer the question in the problem.

1. The Blair company makes two types of pianos: spinets and consoles. The equipment in the factory allow for making at most 450 spinets and 200 consoles in one month. It cost $600 to make each spinet piano and $900 to make each console piano. The profit is $125 on each spinet piano $200 and on each console piano. During the month of June, the company can spend $300,000 to make pianos. To make the greatest profit, how many of each type should be made in June? How much will the profit be?

2. Raw materials A and B are used to make one of the Sun Company's products. The product must contain no more than 9 units of material A and at least 18 units of material B. It must cost no more than $300. Material A cost $4 per unit and weighs 10 pounds per unit. Material B costs $12 per unit and weighs 20 pounds per unit. How much of each raw material should be used to maximize the weight? What is the maximum weight?

3. The area of a parking lot is 600 square yards. A car requires 6 square yards and a bus requires 30 square yards for parking. The attendant can handle no more than 60 vehicles. If a car is charged $2.50 and a bus $7.50, how many of each should be accepted to maximize income? What will the maximum income be?

4. A farmer has 20 days in which to plant corn and beans. The corn can be planted at a rate of 10 acres per day and the beans at a rate of 15 acres per day. The farm has 250 acres available for these crops.
   a. If profits from corn are $30 per acre and profits from beans are $25 per acre, determine the number acres of corn and the number acres of beans that would maximize profits.
   b. If profits from corn are $29 per acre and profits from beans are $30 per acre, determine the number acres of corn and the number acres of beans that would maximize profits.