Applied Optimization Assignment #2

Name: _____

Date: _____ Hour: ____

For each problem, do the following:
(a) Define the variables.
(b) Write the objective function.
(c) Write the constraints.
(d) Graph the constraints.
(e) Identify the vertices of the feasible solutions.
(f) Evaluate the objective function at each of the vertices of the feasible region.
(g) Answer the question(s).

1.

MAXIMIZE PROFIT A tent manufacturer makes a two-person tent and a family tent. Each type of tent requires time in the cutting room and time in the assembly room, as indicated below.

A two-person tent requires:
2 hours in the cutting room
2 hours in the assembly room

A family tent requires:
2 hours in the cutting room
4 hours in the assembly room

The total number of hours available per week in the cutting room is 50. There are 80 hours available per week in the assembly room. The manager requires that the number of two-person tents manufactured be no more than four times the number of family tents manufactured. The profit for the two-person tent is $34 and the profit for the family tent is $49. Assuming that all the tents produced can be sold, how many of each should be manufactured per week to maximize the profit? What is the maximum profit?

2. **MINIMIZE COST** An ice cream supplier has two machines that produce vanilla and chocolate ice cream. To meet one of its contractual obligations, the company must produce at least 60 gallons of vanilla ice cream and 100 gallons of chocolate ice cream per day. One machine makes 4 gallons of vanilla and 5 gallons of chocolate ice cream per hour. The second machine makes 3 gallons of vanilla and 10 gallons of chocolate ice cream per hour. It costs $28 per hour to run machine 1 and $25 per hour to run machine 2. How many hours should each machine be operated to fulfill the contract at the least expense?