

Group Members: _____

Classwork 7 – Optimization

With your group, set up and solve the following optimization problem. Show all work at each step.

A 400-room hotel in Las Vegas is filled to capacity every night at \$75.00 a room. For each \$1.00 increase in price, 4 fewer rooms are booked. If each occupied room costs \$15.00 to service per day, how much should the management charge for each room to maximize profit?

a) Find a formula for the function you want to maximize.

b) What is a feasible domain for the function in part (a)?

c) Determine the critical number(s) of the function.

d) Use the first or second derivative test to classify the critical number(s) in part c).

e) At what price does the hotel maximize profit? What is the profit at this price?