Applied Max/Min Homework Exercises - "Hotel Exercises"
Spring 2016

Pat Rossi   Name _____

The Hotel Problem

1. A certain hotel has 180 rooms that can be rented. Management rents the hotel out to private groups for exclusive use, provided that the group renting the hotel rents a minimum of 100 rooms per night. When 100 rooms are rented, the rate per room, per night is $120. To offer the groups incentive to rent more rooms, management has the following policy: for each room, in excess of the required minimum of 100 rooms, that the group rents, the rate per evening for ALL rooms is discounted by $0.75.

   How many rooms must be rented out by a group in order for management to realize maximum revenue?

   ans: 130

2. The senior class of Roger Williams University is renting a cruise ship ("The Bay Queen") for exclusive use, during the evening prior to their graduation. The ship can hold 800 passengers and the management requires that a minimum of 400 tickets be sold in order for the ship to set sail. When 400 tickets are sold, the price per ticket is $100. As an incentive to prospective passengers, management offers the following deal: For each ticket, in excess of the required minimum of 400 that are sold, the price of ALL tickets will be reduced by $0.10.

   How many passengers must buy tickets in order for management to realize maximum profit?

   ans: 700

3. PUBCO, a local publisher and printer, produces yearbooks for high schools. For high schools that have at least 250 students and no more than 450 students, they have their standard product offer: Their 200 page yearbook at $36 per yearbook, if 230 orders are placed. As incentive for students to buy a yearbook, they offer the following deal: for each order placed above the required minimum of 230 orders, the price per order will be reduced by $0.10.

   How many orders must be placed in order for management to realize maximum profit?

   ans: 295

4. A local cable provider currently has 10,000 cable subscribers in the town of Happy Valley. They pay a monthly rate of $60. Experience gained from raising rates in other areas shows that for each dollar that the monthly rate is increased, 100 customers will change to another provider. What monthly rate will give the cable provider its maximum revenue? (The thought of *decreasing* the monthly rate is something that never occured to the cable provider.)

   ans: $80