Name:
Section 4.4
Math 151

1. The demand for tickets to an amusement park is given by

$$p = 70 - 0.02q$$

where p is the price of a ticket in dollars and q is the number of people attending at that price.

(a) What price generates an attendence of 3000 people? What is the total revenue at that price? What is the total revenue if the price is \$20?
If $q = 3000$, the demand equation yeilds $p = 10$. That is, at a price of \$10, 3000 attend. The total revenue is $\$30,000$. To find the revenue when the price is 20, use the demand equation to solve for the quanity, 2500. In this case the total revenue is $\$50,000$.

(b) What attendence maximizes revenue?
We find the revenue function first,

$$R(q) = (70 = 0.02q)q = 70q - 0.02q^2$$

The attendence that maximized revenue occurs at the critical point so

$$\begin{aligned} R'(q) &= 70 - 0.04q \\ 0 &= 70 - 0.04q \end{aligned}$$

yeilds a demand of $q = 1750$.

(c) What price should be charged to maximize revenue?
Use the demand equation to find the price p that corresponds to a demand of 1750, $p = 35$

(d) What is the maximum revenue? Can we determine the corresponding profit?
Use the revenue function to get $R(1750) = \$61,250$