

Math 134 Managerial Calculus

Homework 19 Spring 2021

Due May 7, 2021

1. The demand function for a certain brand of DVD is given by

$$p = -0.001x^2 - 0.2x + 8$$

where p is the unit price in dollars and x is the quantity demanded each week, measured in units of a thousand. Determine the consumers' surplus if the market price is set at \$18 per disc.

2. The demand function for a certain kind of laptop is given by

$$p = 600e^{-0.04x}$$

where p is the unit price in dollars and x (in units of a hundred) is the quantity demanded each month.

- (a) Find the number of laptops demanded per month of the unit price is set at \$500 per laptop.
 - (b) Use the results of part (a) to find the consumers' surplus if the selling price is set at \$500 per laptop.
3. The supplier of the DVD in problem #1 will make x hundred units available in the market when the unit price is

$$p = \sqrt{36 + 1.8x}$$

dollars. Determine the producers' surplus if the market price is set at \$9 per unit.

4. The manufacturer of the brand of laptops of problem #2 will make x hundred units available in the market when the unit price is

$$p = 100 + 80e^{0.05x}$$

dollars.

- (a) Find the number of laptops demanded per month of the unit price is set at \$400 per laptop.
- (b) Use the results of part (a) to find the producers' surplus if the selling price is set at \$400 per laptop.
5. A new restaurant is expected to produce a continuous income stream at the rate of

$$R(t) = 100,000$$

dollars per year for the next 5 years. In the prevailing interest rate is 4% per year compounded continuously, find the future value of the income stream.

6. Suppose an investment is project to generate income at the rate of

$$R(t) = 150,000$$

dollars per year for the next 4 years. Find the present value of this investment if the prevailing interest rate is 7% per year compounded continuously.

7. Extra credit: If you had to take Managerial Calculus 2 (which doesn't exist) this fall with me as your instructor, would you prefer the lectures to be pre-recorded, or live?

Please use several sentences to explain. Preferably, list your likes & dislikes of each option, weighing in on the one for which the pros outweigh the cons.