

Econ 30010
Intermediate Microeconomic Theory

Monopoly Problems

1) Suppose a monopolist faces market demand described by $P = 18000 - 1000Q$ where P is the price the monopolist charges to all of its customers and Q is the quantity demanded. Suppose also that the monopolist has total costs of $20000 + Q^3$. Derive the monopolist's profit-maximizing price and quantity and calculate the associated profits.

2) A professor has just signed a book contract that pays her \$15,000 plus 15% of sales revenues. If the publisher cares only about its profits while the author cares only about her earnings, who will want to charge a higher price for the book?

3) A book publisher is planning on releasing a new book in both the United States and in England. The publisher's cost function is

$$TC = 50,000 + Q^2/2000$$

where Q is the total number of books sold in both countries.

Demand for this new book in the United States is

$$Q^{US} = 50,000 - 2000P^{US}$$

and in England demand is

$$Q^E = 10,000 - 500P^E$$

where Q^{US} and Q^E are the quantities demanded in each country and P^{US} and P^E are the respective prices. The data for the British market is measured in dollars so you need not worry about exchange rate problems.

a) If the publisher uses a third-degree price discrimination strategy, what prices should it set and how many books should it produce for sale in each country?

b) Suppose that after printing the optimal number of books some of them are destroyed by a burst water main. After checking all of the books the publisher learns that it has only 12,000 in good condition. How many of these books should it sell in the United States and how many should it sell in England? Explain the economic justification for this allocation.

4. Consider a market which is a natural monopoly. This means the government should allow the market to be served by a monopolist and it should regulate the monopolist. Demand in the market is described by the inverse demand curve, $P = 250 - .5Q$. The monopolist's cost of production is $TC(Q) = 200 + \theta Q$. The monopolist knows the value of θ but the government does not. What the government does know is that θ is either equal to 5 or 10 and that the probability that θ is equal to 5 is .6. The government wishes to maximize the sum of consumer surplus plus tax revenues.

a. Calculate the optimal quantity the government should allow the monopolist to produce and the tax it should charge when $\theta=5$ and when $\theta=10$ assuming the government can observe θ .

b. Calculate the optimal quantity the government should allow the monopolist to produce and the tax it should charge when $\theta=5$ and when $\theta=10$ when the government cannot observe θ .

c. Explain the economic significance of the differences between your answers to parts (a) and (b).