

Problem Set #13

Sonoma State University

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Economics 305-Intermediate Microeconomic Theory

- (1) Consider the following demand and cost functions for a monopolistic firm.
The industry demand is given by $Q = 1000 - 5P$.
The firm's total cost is given by $TC(q) = 300 + \frac{q^2}{3}$. Assume this represents both the short run and long run costs of the firm.
- (a) Find the equilibrium price and quantity for a single price monopolist.
 - (b) Calculate the average total cost at the profit maximizing output.
 - (c) Calculate the amount of the monopoly profits per unit.
 - (d) Calculate the amount of the monopoly total profits.
 - (e) Find the competitive equilibrium.
 - (f) Calculate the amount of consumer surplus under the single price monopoly.
 - (g) Calculate the amount of consumer surplus under perfect competition. Compare consumer surplus under monopoly and perfect competition. Which is greater?
 - (h) Calculate the amount of producer surplus under the single price monopoly.
 - (i) Calculate the amount of producer surplus under perfect competition. Compare producer surplus under monopoly and perfect competition. Which is greater?
 - (j) Calculate the amount of the deadweight loss. What causes the deadweight loss?
 - (k) Show the above answers graphically.
- (2) Suppose now that the monopolist engages in perfect (first degree) price discrimination.
- (a) What is the equilibrium price and quantity of the perfectly price discriminating monopolist.
 - (b) What is the amount of consumer surplus. Compare the consumer surplus with that calculated under perfect competition and the single price monopoly.
 - (c) What is the amount of producer surplus. Compare the consumer surplus with that calculated under perfect competition and the single price monopoly.
 - (d) Calculate the amount of the deadweight loss. Compare the dead weight loss with that calculated under perfect competition and single price monopoly.
 - (e) Show the above answers graphically.
- (3) Suppose instead that the monopolist wants to engage in second degree price discrimination by employing a two part tariff.

Suppose also that the market consists of two types of consumers that can be represented by the following demand equations.

$$\text{Consumer Type One: } Q_1 = 500 - P_1$$

$$\text{Consumer Type Two: } Q_2 = 500 - 4P_2$$

Assume that output can be produced at a constant marginal cost of \$10 which also equals average total cost.

- (a) If the monopolist wants to maintain both types of consumers, find the price per unit and the amount of the tariff that will maximize the monopolists total profits.
 - (b) Show the above answer graphically.
 - (c) If the monopolist wants to retain only it's most profitable consumers, find the price per unit and the amount of the tariff that will maximize the monopolists total profits.
 - (d) Show the above answer graphically.
 - (e) Which pricing strategy would you suggest, (a) or (c)? Explain your answer.
- (4) Suppose instead that the producer wants to engage in third degree price discrimination.
- (a) What market conditions must exist in order to engage in third degree price discrimination?
 - (b) Derive the marginal revenue function for market one.
 - (c) Calculate the profit maximizing price, output and profits in market one.
 - (d) Derive the marginal revenue function for market two.
 - (e) Calculate the profit maximizing price, output and profits in market two.
 - (f) Show your answers for a-e above graphically.
- (5) Which pricing strategy produces the maximum profits?