

Problem 1: Long run total cost function and total revenue function of the monopolist are:

$$TC = 1500q - 60q^2 + q^3$$

$$TR = 975q$$

Find the optimal quantity of this monopolist. What will be the long run equilibrium price in the industry? How many firms there will be in a long run if the demand function is $D : P = 9600 - 2Q$?

Problem 2: The demand function in the industry and the total cost function of the monopoly are:

$$D : Q_D = 2000 - 20P$$

$$TC = 0.05Q^2 + 10000$$

Find the optimum of this monopoly (equilibrium price, quantity, and corresponding profit) and depict it on the graph. Find price elasticity of demand and interpret the result.

Problem 3: Consider the monopoly from the previous problem. What happens if the monopolist has to pay unit tax $t = 20$? What happens if the regulator sets the price to $P = 60$?

Problem 4: Monopoly: A monopolist can produce at constant average and marginal costs of $AC = MC = 5$. The firm faces a market demand curve given by $Q^D = 53 - P$.

- (a) Calculate the profit-maximizing price-quantity combination for the monopolist. Also calculate the monopolists profits and consumer surplus.
- (b) What output level would be produced by this industry under perfect competition if every firm could produce at the same average and marginal cost as the monopoly?
- (c) Calculate the consumer surplus obtained by consumers in part (b). Show that this exceeds the sum of the monopolists profits and consumer surplus received in part (a). What is the value of the deadweight loss from monopolization?

Problem 5: Suppose that a monopolist faces two markets with demand curves given by:

$$D_1(p_1) = 100 - p_1$$

$$D_2(p_2) = 100 - 2p_2$$

Assume that the monopolist's marginal cost is constant at \$20 a unit. If it can price discriminate, what price should it charge in each market in order to maximize profits? What if it can't price discriminate? Then what price should it charge?