1. For the production function \( f(L, K) = L + \sqrt{K} \), state whether it has IRTS, DRTS or CRTS. Prove your answer.

2. Suppose that a perfectly competitive firm has a long-run supply function \( LTC(Q) = kQ^2 \). Suppose also that the prevailing market price is \( p \). For what values of \( k \) and \( p \) does this firm exit the market?

3. Suppose that the supply of the competitive fringe is given by \( Q^f(p) = 10 + 2p \). Suppose that there is a dominant firm with a marginal cost \( MC = 2 \) and no fixed costs. The market demand function is given by \( Q^M(p) = 100 - p \).

   (a) Find the profit maximizing price for the dominant firm, and its profit.

   (b) Find the monopoly price and its profits (that is, suppose the firm faces the whole market demand and there is no fringe) and compare it to the dominant firm’s profit you get above. Which market structure is more socially desirable, dominant firm with a fringe or a monopoly? Why?

   (c) What happens to the dominant firm’s profit when the demand is more price elastic? Why?

4. In a two-period lived economy, one consumer wishes to buy a TV set in period 1. The consumer lives for two periods, and is willing to pay a maximum price of 100TL per period of TV usage. In period 2, two new consumers join the market, so they live in period 2 only. Each of the two new consumers is willing to pay a maximum of 50TL for using a TV in period 2. Suppose that there is only one firm producing TV sets, that TV sets are durable for two periods, and that the production is costless. Find the prices the monopoly charges for TV sets in periods 1 and 2.

5. What is the effect of used units on a durable good monopolist’s new unit price? What would happen to this effect if the monopolist could reduce the durability of the new units? And if the monopolist does so, what would happen to the availability of used units? Give an example of a real world practice along these lines.