

Microeconomics I - Midterm

Undergraduate Degree in Business Administration and Economics

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Please answer each group in a separate sheet. Good luck!

Question 1 - Consumers in Talkland have preferences given by

$$u(x, y) = y + 2\sqrt{x},$$

where x is monthly minutes of phone communications and y represents all other goods. Each consumer has an income of m and the price of phone calls is p , whereas the price of other goods is normalized to one.

- (a) Find the demand for x and y . (2 points)
- (b) Determine the optimal choice when $p = 0.1$ and $m = 20$. (1 point)
- (c) Consider a price increase to $p = 0.2$ for the same income level. Decompose it into substitution and income effect. How much would income have to increase to keep the utility level from part (b)? (2 points)
- (d) Suppose the telecommunications company offers a new plan with a monthly fixed cost of 14, which allows customers 150 minutes of free communications per month. Any extra minute above those 150 is paid at an unitary price of 0.1. Determine the optimal choice for the consumers when the new plan is purchased and consumers have the same income as before. Would consumers prefer the price in part (b) or the new plan? (2 points)

Question 2 - Imagine you are the CEO of a consulting firm and that you can hire economists (l_1) or engineers (l_2) to provide consulting projects (q) to your clients. The wages of economists and engineers are given by $w_1 = 1600$ and $w_2 = 1800$, respectively. Your firm produces consulting projects according to the following production function

$$F(l_1, l_2) = \min(4l_1^{2/3}, l_2^2).$$

- (a) Determine the optimal choice of l_1 and l_2 that allows you to produce q projects. (1.5 points)
- (b) Determine the long run cost curve for the prices provided above. (1.5 points)
- (c) Assuming this is a competitive market, determine the individual supply curve $p(q)$ for consulting projects. (2 points)
- (d) Aggregate demand for consulting projects is given by $Q = 2100 - p$. Determine the long run equilibrium for this competitive market with free entry, specifying the price, aggregate quantity produced, and number of firms operating. (2 points)

Question 3 - Answer all of the following questions.

(a) What are returns to scale? Analyze the returns to scale of the following production function. (1.5 points)

$$F(k, l) = (k^{-\rho} + l^{-\rho})^{-2/\rho}, \text{ with } \rho \geq -1.$$

(b) What is the relationship between the short run and long run cost curves? (1.5 points)

(c) What is the difference between economies of scale and economies of learning? (1.5 points)

(d) What are the main characteristics of a monopolistic market? (1.5 points)