Tel Aviv University
Faculty of Management
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Microeconomics for Management - Yossi Spiegel

Problem set 8

Problem 1

A firm produces its output using a single input. The production function is given by $q = bx^{\alpha}$, where q denotes the output, x denotes the quantity of the input, and b and α are positive constants. The per-unit cost of the input is w.

(a) Derive the cost function of the firm and use it to compute the marginal and average costs.

(b) Illustrate the production function, cost function, and marginal and average cost functions in three seperate graphs. Make sure you distinguish between the case where $\alpha < 0$, $\alpha = 1$, and $\alpha > 1$.

(c) Repeat your answer to (b) under the assumption that the production function is given by $q = 0$ if $x < x_0$, and $q = b(x-x_0)^{\alpha}$ if $x \geq x_0$, where x_0 is some positive constant. Explain in words the meaning of x_0 and explain how it affects the marginal and average cost functions and why.

Problem 2

Consider a perfectly competitive industry with 16 identical firms, each of which has a cost function $c(q) = F + q^2$, where F is a positive constant. The demand function in this industry is $Q = A/p$, where A is a positive constant.

(a) Compute the short-run competitive equilibrium in this industry.

(b) How do changes in A and F affect the equilibrium? Explain the intuition for your answer.

(c) For which values of A and F do firms earn positive profits, negative profits, and 0 profits?