

Microeconomics for Management - Yossi Spiegel

Problem set 7

Problem 1

A firm produces its output using a single input. The production function is given by $q = x^\alpha$, where q denotes the output, x denotes the quantity of the input, and α is a positive constant smaller than 1. The per-unit cost of the input is w .

- (a) Derive the cost function of the firm and show it in a graph.
- (b) How does the cost function change when w increases? Explain the intuition for your answer.
- (c) How does the cost function change when α increases? Explain the intuition for your answer.

Problem 2

A firm uses two factors of production to produce a single output and its production function is given by $q = \text{Min}\{x_1, x_2/b\}$, where b is some positive constant. The per unit costs of the two factors are w_1 and w_2 .

- (a) Derive the cost function of the firm and show it in a graph.
- (b) Repeat your to (a) under the assumption that firm already has 10 units of factor 1 that it can use at no additional cost.

Problem 3

A firm uses two factors of production to produce a single output and its production function is given by $q = (x_1^{1/2} + x_2^{1/2})^2$ (this kind of production function is called CES). The per unit costs of the two factors are w_1 and w_2 . Derive the cost function of the firm and show it in a graph.