

time : 1 hour

Do all 4 questions. All count equally.

1. Solve for a perfectly competitive firm's profit-maximizing level of output, as a function of its input prices and output price, if its production function has the equation

$$f(x_1, x_2) = 2(\sqrt{x_1} + \sqrt{x_2})$$

2. What quantities of inputs 1 and 2 will minimize a firm's cost of producing y units of output, if its production function is

$$f(x_1, x_2) = x_1 + \ln(x_2 + 1) \quad ?$$

3. Could a single-price monopoly ever choose an output level at which its own-price elasticity of demand was less than 1 in absolute value? Explain.

4. Suppose that a monopoly can offer its customers several different varieties of a product, varying in their level of quality, and in their price.

The monopoly believes that it serves two different types of customer, with one type much more willing to pay for quality than the other. But it cannot identify directly the type of any individual customer.

What quality levels of product should it offer, and what prices should it charge for them?