Intermediate Microeconomics 301
Second Mid-Term
Thursday, April 3, 2003

Time: 50 minutes.

Instructions. To obtain credit, you must give arguments to support your answer. The numbers in brackets at the start of each question are the numbers of points the questions are worth.

Exercise 1 [35]: Suppose a production function is given by \( f(K, L) = K^{\frac{1}{2}} L^{\frac{1}{2}} \), the price of capital is $10 and the price of labor is $16.

1. Does the technology exhibits increasing, decreasing or constant return to scale?

2. What is the marginal product of capital? of labor? What is the Marginal rate of technical substitution?

3. The capital is fixed at the level \( K = 4 \). Is it long run or short run analysis?
   (a) What is the quantity of labor that minimizes the cost of producing any given input?
   (b) What is the minimum cost of producing \( q \) units of output?

Exercise 2 [30]: Suppose a firm has a cost function \( c(y) = (y + 1)^2 \).

1. Find marginal cost, average variable cost and average cost. Graph these functions.

2. What is the firm’s supply curve.

Exercise 3 [35]: Consider that demand for Barbie dolls is described by equation \( Q_D = 200 - 4p \), and supply is \( Q_S = 50 + 2p \).

1. Find the equilibrium price and quantity (numerically and graphically).

2. What is the consumers’ surplus? What is the producers’ surplus?

3. To protect the Barbie doll industry, the government decides to impose a price floor of $15. What is the impact of this policy on the equilibrium? Does it reduce, increase or has no influence on total welfare?