Intermediate Microeconomics 301
Second Mid-Term
Spring 2006
Section 1

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 [30]: Suppose a production function is given by \( f(K, L) = KL^{1/2} \), and that the price of capital is $1 and the price of labor is $1. (Long Run analysis)

1. Does this technology exhibit increasing, decreasing or constant returns to scale?
2. What combination of labor and capital minimizes the cost of producing any given output?
3. What is the minimum cost of producing \( q \) units of output?
4. What are the marginal cost of production and the average cost?

Exercise 2 [35]: Production and costs

1. Suppose capital is fixed at 1 unit in the production function \( Q = K + L^{1/2} \). Define and draw the total, marginal and average product curves for the labor input.

2. Sketch the short run total cost, variable cost, fixed cost, average total cost, average fixed cost, average fixed cost and marginal cost curves for the production function \( Q = K + L^{1/2} \) where \( K \) is fixed at 1 unit in the short run, with \( r = $1 \) and \( w = $1 \).

Exercise 3 [35]: The domestic supply and demand curves for steel are given by \( P = 10 + 2Q \) and \( P = 170 - 2Q \), respectively, where \( P \) is the price in dollars, and \( Q \) is the quantity. There is perfect competition in the world market and thus the total world price is \( P = 60 \).

1. In absence of government policy, what is the supply in US? What is the consumers’ surplus at the equilibrium price? What is the producer surplus?
2. Imagine now that the Congress restricts the importation of steel. The only relevant supply is now the domestic supply. What is the consumers’ surplus? What is the producers’ surplus?
3. What is the effect of this policy on the total welfare? What is the deadweight loss?