

Mid term Exam review questions

Problem 1:

American Mining Company is interested in obtaining quick estimates of the supply and demand curves for coal. The firm's research department informs you that the elasticity of supply is approximately 1.7, the elasticity of demand is approximately -0.85, and the current price and quantity are \$41 and 1,206, respectively. Price is measured in dollars per ton, quantity the number of tons per week.

- Estimate linear supply and demand curves at the current price and quantity.
- What impact would a 10% increase in demand have on the equilibrium price and quantity?
- If the government refused to let American raise the price when demand increased in (b) above, what shortage is created?

Problem 2:

Consider following production function of DVDs $q = L^{0.5}K^{0.5}$.

In the short run, the capital units are fixed at $K=100$ and the cost of capital and labor are equal to \$ 4 and \$ 2 respectively.

- What is the equation of the total and average total cost as a function of quantity?
- What is the equation of the marginal cost in the short term as a function of quantity?
- At what output level the firm is minimizing its cost on the short term?
- How many units of labor are required for the firm to minimize its cost?

In the long term, both capital and labor are changing.

- What is the optimal input ratio of labor (L) and capital (K) for the production?
- What is the cost of producing 500 DVDs at the optimal level?

Problem 3:

The Montreal Press produces memo pads in its local shop. The company can rent its equipment and hire workers at competitive rates. Equipment needed for this operation can be rented at \$48 per hour, and labor can be hired at \$12 per worker hour. The company has allocated \$200,000 for the initial run of memo pads. The production function using available technology can be expressed as:

$$Q = 0.25K^{0.2}L^{0.8}$$

where Q represents memo pads (boxes per hour), K denotes capital input (units per hour), and L denotes labor input (units of worker time per hour).

- Find the optimal input ratio in the long run.
- Determine the appropriate input mix to get the greatest output for a cost of \$200,000 for a production run of memo pads. Compute the level of output.
- Calculate the new input mix in the short run (keeping capital fixed) if production were increased by 200 units per hour.
- Calculate the new cost of production in the short run.
- Draw isoquants and isocost line, show the long term mix and the short term one and show the short term expansion path. Label your graph.