

**ANSWERS: Quiz #4**  
**APEC 3001**  
**Applied Microeconomics:**  
**Consumers, Producers, and Markets**  
**(Summer 2007)**  
**Instructor: Hurley**

**Name:**

*Please show all the work you do to solve a problem.*

1. What are pecuniary diseconomies and how do they affect the shape of the long-run supply curve? **(1.5 Points)**

**Answer:** Pecuniary diseconomies arise when an expansion of industry output leads to an increase in the prices of inputs. The net effect is to make the long-run supply curve upward sloping.

2. What is perfect price discrimination and how does it affect the efficiency of monopoly behavior? **(1.5 Points)**

**Answer:** Price discrimination is the practice of charging different buyers different prices for the same product. Perfect price discrimination is price discrimination where the price a buyer pays equals his willingness to pay. Perfect price discrimination improves the efficiency of monopoly behavior because it eliminates the dead weight loss associated with nondiscriminatory behavior.

3. What is the price elasticity of supply when supply is  $Q_S = 60P - 400$  and the price is  $P = 10$ ? (2.5 Points)
- a. 3
  - b. 1/3
  - c. -1/3
  - d. -3

**Answer:** a. The price elasticity of supply is defined as  $e_s = \frac{\Delta Q_s}{\Delta P} \frac{P}{Q_s}$ . When  $P = 10$ ,  $Q_S = 60 \times 10 - 400 = 200$ .  $\Delta Q_S / \Delta P = 60$ . So,  $\epsilon_S = 60 \times 10 / 200 = 3$ .

4. Suppose a firm has fixed cost of  $FC = \$450$  and variable cost equal to  $VC = 20Q + Q^2$ . If the price is equal to \$50, how much should this firm produce in the short-run? (2.5 Points)
- a. 30.
  - b. 15.
  - c. 10.
  - d. 0.

**Answer:** b. To find the firm's optimal output in the short run, we need to find the quantity where  $P = MC$  such that  $P > AVC$  and  $MC$  is increasing.  $TC = FC + VC = 500 + 20Q + Q^2$ , so  $MC = 20 + 2Q$ .  $MC' = 2 > 0$ , so  $MC$  is increasing.  $P = MC$  implies  $50 = 20 + 2Q^*$  or  $Q^* = 15$ . For  $Q = 15$ ,  $AVC = VC/Q = 20 + Q = 20 + 15 = 35 < 50$ , so it is optimal to produce 15 in the short run rather than shutting down.

5. The figure below illustrates a monopolist's average total cost (labeled ATC), average variable cost (labeled AVC), and marginal cost (labeled MC). It also illustrates the demand faced by the monopolist (labeled  $Q_D$ ). (8 Points)
- What are the three profit maximizing conditions for a monopolist in the short-run?
  - Illustrate the monopolist's marginal revenue on the figure below and label it MR.
  - Illustrate the monopolist's short-run profit maximizing quantity and price on the figure below and label them  $Q^*$  and  $P^*$ .
  - Will this firm earn a profit or loss in the short-run? Illustrate this profit or loss on the figure below. If this monopolist's long-run average cost was the same as its short-run total cost, would the monopolist continue to operate in the long-run? Justify your answer.

**Answer:**

- A monopolist's short-run profit maximizing conditions are (i)  $MR = MC$ , (ii) the change in marginal cost exceeds the change in marginal revenue ( $MC' > MR'$ ), and (iii)  $P > AVC$ .
- See figure below.
- See figure below.
- The monopolist's optimal quantity results in a price that is above its average variable cost, but below its average total cost, so the monopolist will earn a short-run loss equal to the area **abcd** on the figure below. The monopolist will not continue to operate in the long-run if it cannot lower its costs because it would earn an economic loss and it would be advantageous for it to do something else.

