ANSWERS: Homework #4
Due: 7-9-06
APEC 3001
Applied Microeconomics:
Consumers, Producers, and Markets
(Summer 2007)
Instructor: Hurley

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

1. What is the difference between accounting and economic profit?

   Answer: Accounting profit includes explicit costs and benefits (e.g. revenues), while economic profit includes implicit, as well as explicit, costs and benefits. In particular, accounting profit does not consider opportunity costs, while economic profit does.

2. One assumption economists make about perfect competition is that factors of production are perfectly mobile in the long run. What are the implications of this assumption in terms of a firm's long run economic profit and the industry supply curve when there are no pecuniary diseconomies?

   Answer: With perfect factor mobility in the long run firms cannot earn an economic profit in the long run because if there were economic profits other firms would enter the industry driving the price down and economic profits to zero. If there are no pecuniary diseconomies in the long run, increases in industry output do not increase the price of inputs or increase costs. Therefore, the long run supply curve is perfectly elastic and equal to the minimum long run average total cost.

3. What are three important differences between a monopoly and perfectly competitive industry?

   Answer: .

Perfect Competition	Monopoly
Many Sellers	One Seller
Many Perfect Substitutes	No Close Substitutes
Price Determined By Market Not Individual Sellers (Face Perfectly Elastic Demand)	Price Determined By The Only Seller (Face Downward Sloping Demand)

4. What are three sources of monopoly power?

   Answer:
   1. Exclusive Control Over Inputs
   2. Economies of Scale
   3. Patents
   4. Network Economies
   5. Government Licenses Or Franchises

5. Suppose a firm has fixed cost of FC = \$100 and variable cost equal to VC = $Q + Q^2/2$. If the price is equal to \$10, how much should this firm produce in the short run?
   a. 0.
   b. 9.
   c. 14.
   d. 17.

   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 = $100 + Q + Q^2/2$, so MC = 1 + Q. MC' = 1 > 0, so MC is increasing. P = MC implies 10 = 1 + Q or Q = 9. For Q = 9, AVC = VC/Q = 1 + Q/2 =4.5 + 1 = 5.5 < 10, so it is optimal to produce 9 in the short run rather than shutting down.

6. What is the price elasticity of supply when the supply curve is $Q_S = 8P - 16$ and the price is P = 4?
   a. -2
   b. -1/2
   c. 1/2
   d. 2

   Answer: d. The price elasticity of supply is defined as $e_S = \frac{\Delta Q_S}{\Delta P}\frac{P}{Q_S}$. When P = 4, Q_S = $8\times4 - 16 = 16$. $\Delta Q_S/\Delta P = 8$. So, $\varepsilon_S = 8 \times 4/16 = 2$.

7. Consider the demand P = 850 – 20Q. If a monopoly's marginal costs are MC = 50, what are the monopoly's optimal equilibrium price and quantity if it is optimal for the monopoly to produce?
   a. P* = $40 and Q* = 50.
   b. P* = $50 and Q* = 40.
   c. P* = $450 and Q* = 20.
   d. P* = $50 and Q* = 20.

   Answer: c. To find the monopolies equilibrium price and quantity, we need to set marginal revenue equal to marginal cost. Total revenue is $TR = (850 - 20Q)Q = 850Q - 20Q^2$, so marginal revenue is MR = 850 – 40Q. Setting MC = MR, then implies 50 = 850 – 40Q* or Q* = 20. To find the price, we solve $P^* = 850 - 20Q^* = 850 - 20 \times 20 = \$450$.

8. Which of the following statements is **false**?
   a. A monopoly will choose an output where the price of the product equals the marginal cost of production.
   b. A monopoly will produce output in the short run only if the price exceeds the average variable cost.
   c. A monopoly will never produce where demand is inelastic.
   d. A monopoly has no supply curve.

   Answer: a.
   a. False. A monopoly chooses its output where marginal revenue equals marginal cost. For a monopoly, marginal revenue decreases as the quantity produced increases, which means price will exceed, not equal, marginal cost.

   b. True. For a monopoly to produce in the short run it must be able to cover its average variable cost. If it cannot, it is better off producing nothing.

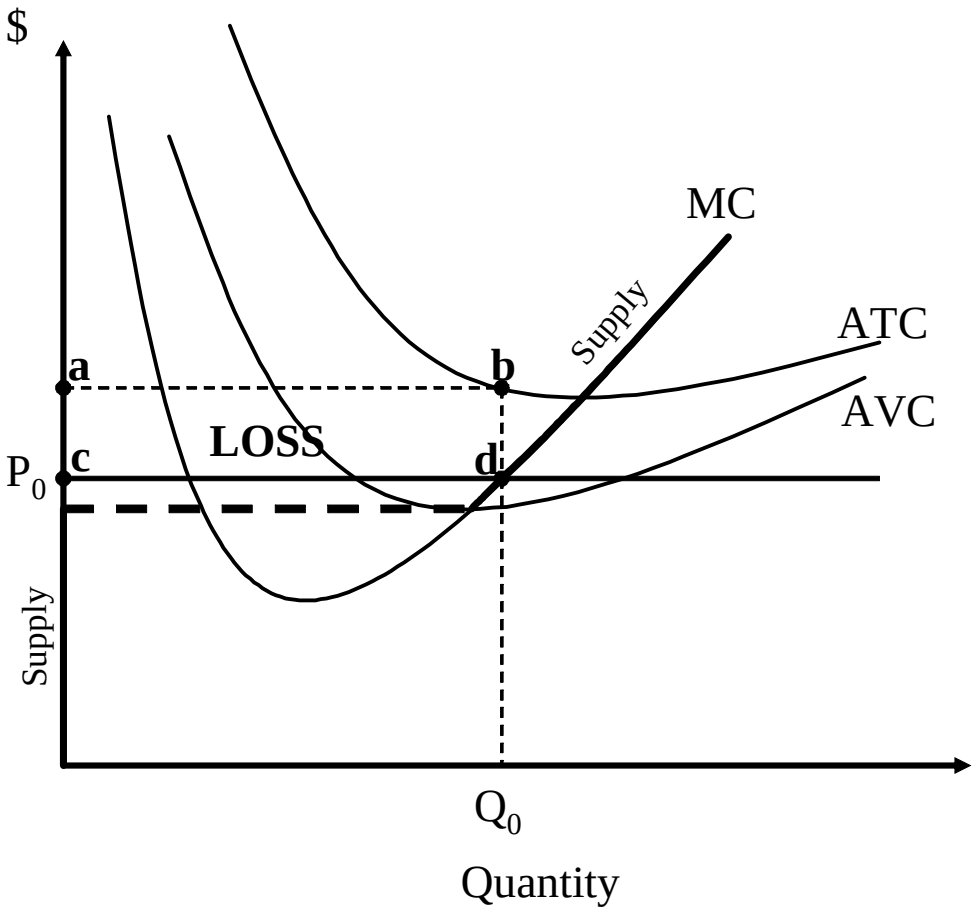
   c. True. When demand is inelastic, increasing quantity decreases revenue and increases costs, so profit must fall. Therefore, a monopoly will never produce where demand is inelastic and will produce where demand is elastic.

   d. True. Monopoly's choose price and quantity. Therefore, they have not supply curve!

9. The figure below illustrates a firm's average total cost curve, average variable cost curve, and marginal cost curve. It also illustrates the equilibrium market price.
   a) What are a perfectly competitive firm's three short-run profit maximizing conditions?
   b) Given these three conditions, label the firm's optimal short-run level of output Q_0 on the figure below.
   c) On the figure below, illustrate the firm's short-run profit/loss.
   d) On the figure below, illustrate the firm's short-run supply curve.

Answer:

a) The three conditions are: (i) price equals marginal cost, (ii) marginal cost is increasing, and (iii) price exceeds average variable cost.
b) Se below.
c) The firm earns a loss of area **abcd** on the figure below.
d) See below.



10. The Figure below shows the **linear** demand (D) faced by a monopolist as well as its short-run marginal costs (MC), average variable costs (AVC), and average total costs (ATC).
    a) Sketch the marginal revenue curve for this **linear** demand on the Figure below and label it MR.
    b) Show the monopolist's optimal level of output and price labeling them Q* and P*.
    c) Will this monopolist earn positive or negative economic profit in the short run?
    d) Use the figure to explain why many economists consider monopolies to be inefficient.

    Answer:
    a) See Figure.
    b) See Figure.
    c) The monopolist will earn positive economic profit because P* > ATC*.
    d) With the monopoly consumer surplus is area **abg** and producer surplus is area **gbde** for a total surplus of **abde**. If the monopoly acted like a perfect competitor and set price equal to marginal cost to choose its output and price, consumer surplus would be area **acf**, while producer surplus would be area **fce**. Total surplus would be **ace**, which exceeds total surplus with monopoly behavior by area **bcd**. Therefore, some economists argue monopoly is inefficient and bad. However, care must always be taken. Notice that at the competitive price P < ATC, which implies negative profit or that perfect competitors would leave this industry in the long run, while a monopolist would possibly stay.