

Answers to Homework # 7

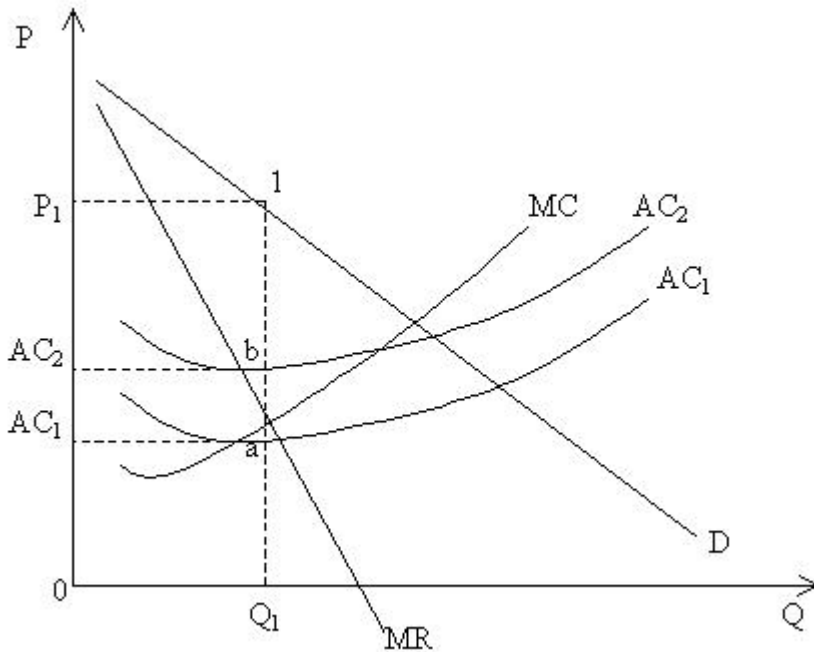
(1) Answer questions 11.2 and 11.23 –part c *only* on page 342 and 343 of the textbook.

Answer to 11.2

We would be better off having the vaccine produced by a monopoly; a monopolistically produced good is better than none.

Answer to 11.23

c. The increase in rent shifts the AC curve up, but leaves MC unchanged. Hence, price and output do not change, but profit falls by the amount of the increase in fixed cost. Profit falls from area P1, 1, a, AC1 to area P1, 1, b, AC2.



(2) a. Suppose marginal cost of gasoline is \$1.00, and an isolated gasoline station in Nevada has a price elasticity of demand for gasoline of 2. What will the station charge for gasoline? b. What is the Lerner index?

a. Using the formula, $P = MC / [1 - (1/n)]$, we have $P = \$1.00 / 0.5 = \2 .

b. The Lerner index is calculated as $(P - MC) / P$. It is 1/2 in this example.

(3) The demand function for a monopolist is $P = 30 - 0.75Q$; total costs are $TC = 20 + 9Q + 0.3Q^2$; marginal revenue is $MR = 30 - 1.5Q$; and marginal cost is $MC = 9 + 0.6Q$. a. What is the

profit-maximizing rate of output? b. What are the profits? c. What would be the price and output under perfect competition if the monopolist's marginal cost curve is the competitive industry's supply curve? d. Calculate the amount of the deadweight loss associated with the monopoly outcome.

a. The profit maximizing output level is determined by setting $MR = MC$. Equating MR and MC yields an output level of 10. Plugging this profit-maximizing Q back into the demand curve gives $P = \$22.50$.

b. Profit = TR - TC. Substituting $Q = 10$ back into the equation $30Q - 0.75Q^2 - 20 - 9Q - 0.3Q^2$ yields a profit of \$85.

c. Under perfect competition, $P = MC$, so $30 - 0.75Q = 9 + 0.6Q$ gives $Q = 15.56$ and $P = \$18.33$. Note that calculation of profit (as in part b) indicates that this is a SR equilibrium for the perfectly competitive firms because industry-wide profit is \$52.54. These SR profits would be eliminated by the entry of new firms. The entry of new firms in a constant-cost (increasing-cost) industry drives down price (and bids up costs) until the typical firm is producing where the minimum point on the LAC curve is tangent to the price.

d. Compared with the perfectly competitive outcome, the monopolist restricts output and charges a higher price. A first approximation of deadweight loss (DWL) can be calculated as $1/2 \times (\$22.50 - \$15) \times (15.56 - 10) = \20.85 . Graphically, it is the excess of P (or MU) above MC associated with increasing output from the monopoly to the competitive output level. Note that DWL is the area under the demand curve and above the MC curve evaluated between the monopoly and competitive output levels. Integral calculus *could* be used to calculate DWL exactly. Integration of $(30 - 0.75Q) - (9 + 0.6Q)$ or $(21 - 1.35Q) dQ$, yields $21Q - (1.35/2)Q^2$. Evaluating this integral from the output of 10 to 15.56 gives a DWL of \$20.83.