Econ 101 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Summer 2013

Answers to Quiz #4

Please write all answers neatly and legibly.

1. Suppose a perfectly competitive market has the following market demand and supply curves:

Market Demand: Q = 25,000 – 2500P

Market Supply: Q = 2000P - 2000

where P is the price per unit of the good and Q is the total quantity in this market. You are also told that the total cost and marginal cost functions for a representative firm in this industry are given by the following equations where q is the quantity produced by the firm:

Total Cost = TC = q + (1/50)q2 + 312.50

Marginal Cost = MC = 1 + (1/25)q

a. (1 points) What is the equilibrium price, P, and equilibrium market quantity, Q, in this market? For full credit show how you found your answer to this question.

Answer:

To find the equilibrium price and quantity in this market use the market demand and supply equations. Thus, 25,000 – 2500P = 2000P – 2000

27,000 = 4500P

P = $6 per unit

Q = 25,000 – 2500P = 25,000 – 2500(6) = 10,000 units

Or, Q = 2000P – 2000 = 2000(6) – 2000 = 10,000 units

b. (2 points) What is the quantity, q, produced by the representative firm? Assume that all firms in this industry are identical and face identical cost curves. For full credit show how you found your answer to this question.

Answer:

The representative firm is a price taker and will see the market price of $6 as being its marginal revenue curve. It will profit maximize by producing that level of output where MR equals MC. Thus, 6 = 1 + (1/25)q or q = 125 units.

c. (1 point) Given the above information, how many firms are in this industry? Show how you found your answer to get full credit for this question.

Answer:

Number of firms in the industry = (Total market output)/(Amount produced by representative firm) Number of firms in the industry = 10,000/125 = 80 firms

d. (2 points) Given the above information, calculate the value of economic profits for this representative firm. For full credit show how you found your answer to this question.

Answer:

To find economic profit for this firm we need to calculate the firm’s total revenue, TR, and the firm’s total cost, TC. Thus,

TR = P\*q = ($6 per unit)(125 units) = $750

TC = q + (1/50)q2 + 312.5 = 125 + (1/50)(125)(125) + 312.5 = $750

Profits = TR – TC = 750 – 750 = $0

e. (4 points) Suppose that demand in this market increases by 9000 units at every price. Holding everything else constant, find the new short-run market quantity, Q’; the new short-run equilibrium price, P’; the new short-run quantity produced by the representative firm, q’; and the new level of economic profits in the short-run. Show your work for full credit and make sure it is easy for the grader to find your answers.

Answer:

To answer this question you will first need to find the new market demand curve. You know that this market demand curve will be parallel to the original market demand curve (that implies it will have the same slope) but it will be 9000 units further to the right. So, for example, we know that the point (19,000; 6) sits on the new line. Using this information we can write the new market demand curve as P = b – (1/2500)Q and therefore 6 = b – (1/2500)(19,000) or b = 13.6. The new market demand curve is therefore P = 13.6 – (1/2500)Q.

The new equilibrium will be where the new market demand curve intersects the original supply curve: thus,

P = 13.6 – (1/2500)Q

And Q = 2000P – 2000

We can write P = 13.6 – (1/2500)[2000P – 2000]

P = 13.6 – (1/2500)(2000P) + (1/2500)(2000)

P = 13.6 – (4/5)P + (4/5)

P + (4/5)P = 13.6 + .8

1.8P = 14.4

P = $8 per unit

Q = 2000(8) – 2000 = 16,000 – 2000 = 14,000 units

Or, P = 13.6 – (1/2500)Q and 8 = 13.6 – (1/2500)Q

5.6 = (1/2500)Q

Q = 14,000 units

MR = MC

8 = 1 + (1/25)q

7 = (1/25)q

q = 175 units = amount produced by the representative firm

Profit for representative firm = TR – TC

Profit for representative firm = ($8 per unit)(175 units) – [175 + (1/50)(175)(175) + 312.50]

Profit for representative firm = $1400 – [175 + 175(3.5) + 312.50]

Profit for representative firm = $1400 – [175 + 612.5 + 312.5]

Profit for representative firm = $1400 - $1100 = $300