

EE211 Section 1

Homework 5 Answers

Explain your answers with graph in details.

Mankiw, N.G., (2023) **Principles of Microeconomics**, 10th ed., Cengage, (ISBN-13: 978-981-5119-30-5)

Chapter 15

Problems and Applications # 1, 3 and 4

- a. As shown in Figure A, the typical firm's initial marginal-cost curve is MC_1 and its average-total-cost curve is ATC_1 . In the initial equilibrium, the market supply curve, S_1 , intersects the demand curve at price P_1 , which is equal to the minimum average total cost of the typical firm. Thus, the typical firm earns no economic profit. The rise in the price of crude oil increases production costs for individual firms (from MC_1 to MC_2 and from ATC_1 to ATC_2) and thus shifts the market supply curve to the left, to S_2 .

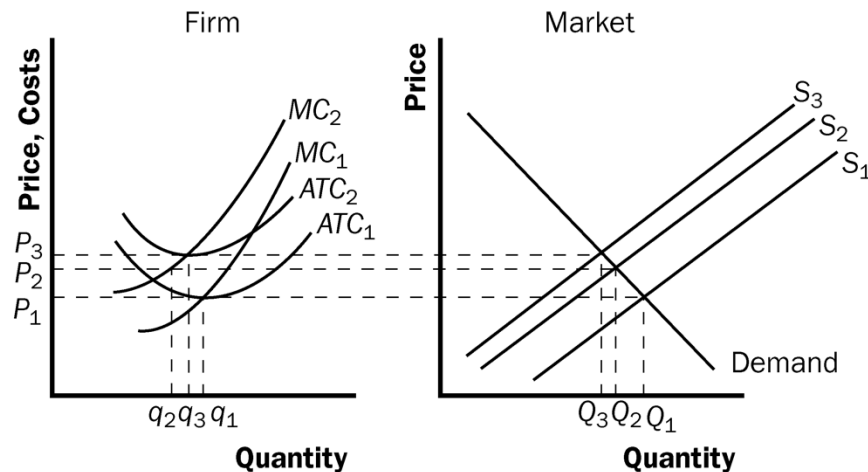


Figure A

- b. When the market supply curve shifts left to S_2 , the equilibrium price rises from P_1 to P_2 , but the price does not increase by as much as the increase in marginal cost for the firm. As a result, price is less than average total cost for the firm, so profits are negative.

In the long run, the negative profits lead some firms to exit the market. As they do so, the market supply curve shifts to the left. This continues until the price rises to equal the minimum point on the firm's average-total-cost curve. The long-run equilibrium occurs with supply curve S_3 , equilibrium price P_3 , total market output Q_3 , and firm's output q_3 . Thus, in the long run, profits are zero again and there are fewer firms in the market.

1. Here is the table showing costs, revenues, and profits:

Quantity	Total Cost	Marginal Cost	Total Revenue	Marginal Revenue	Profit
0	\$8	---	\$0	---	\$-8
1	9	\$1	8	\$8	-1
2	10	1	16	8	6
3	11	1	24	8	13
4	13	2	32	8	19
5	19	6	40	8	21
6	27	8	48	8	21
7	37	10	56	8	19

- i. The firm should produce five or six units to maximize profit.
- ii. Marginal revenue and marginal cost are graphed in Figure B. The curves cross at a quantity between five and six units, yielding the same answer as in Part (a).

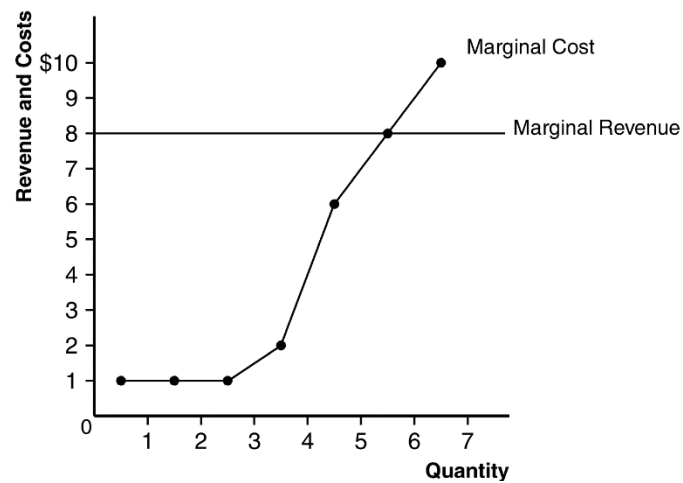


Figure B

- iii. This industry is competitive because marginal revenue is the same for each quantity. The industry is not in long-run equilibrium, because profit is not equal to zero.

4.

- a. Costs are shown in the following table:

<i>Q</i>	<i>TFC</i>	<i>TVC</i>	<i>AFC</i>	<i>AVC</i>	<i>ATC</i>	<i>MC</i>
0	\$100	\$0	----	----	----	----
1	100	50	\$100	\$50	150	50
2	100	70	50	35	85	20
3	100	90	33.3	30	63.3	20
4	100	140	25	35	60	50
5	100	200	20	40	60	60
6	100	360	16.7	60	76.7	160

- b. If the price is \$50, the firm will minimize its loss by producing 4 units, where price is equal to marginal cost. When the firm produces 4 units, its total revenue is \$200 ($\$50 \times 4 = \200) and its total cost is \$240 ($\$100 + \140). This would give the firm a loss of \$40. If the firm shuts down, it will earn a loss equal to its fixed cost (\$100). Shutting down was not a wise decision.
- c. If the firm produces 1 unit, its total revenue is \$50 and its total cost is \$150 ($\$100 + \50), so its loss will still be \$100. This was also not the best decision. The firm could have reduced its loss by producing more units because the marginal costs of the second and third unit are lower than the price.