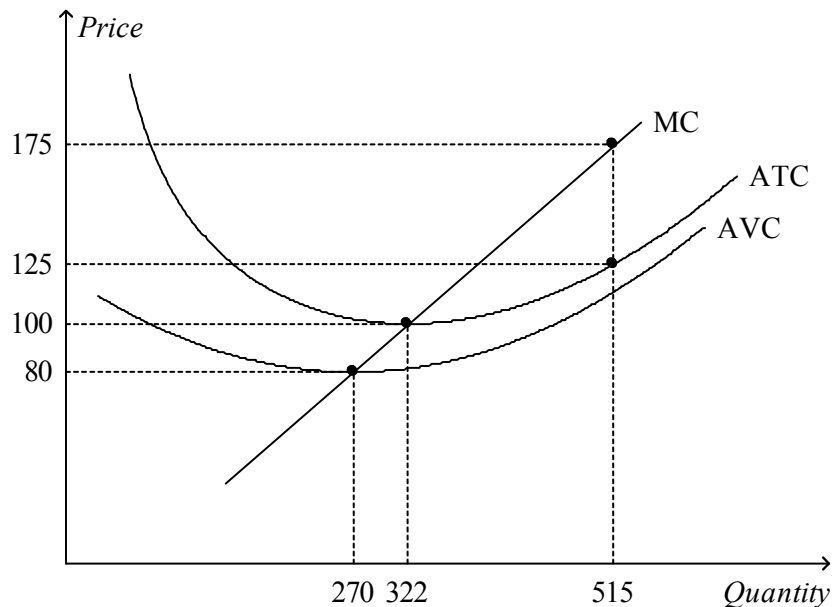


Problem Set 4 Part B

1. A firm uses two inputs in production: capital and labor. In the short run, the firm cannot adjust the amount of capital it is using, but it can adjust the size of its workforce. What happens to the firm's average total cost curve, the average variable cost curve, and the marginal cost curve when
 - a. the cost of renting capital increases?
 - b. the cost of hiring labor increases?
2. Bob's lawn mowing service is a profit maximizing, competitive firm. Bob mows lawns for \$27 each. His total cost each day is \$280, of which \$30 is a fixed cost. He mows 10 lawns a day. What can you say about Bob's short-run decision regarding shutdown and his long-run decision regarding exit?
3. Suppose a firm that is operating in a perfectly competitive market faces total fixed costs (FC) of \$1000 and a market price of \$50. The firm chooses to produce 200 units. The average variable cost (AVC) of producing 200 units is \$55. Is this firm acting like a profit maximizer? Why or why not? (Hint: what are the firm's profits/losses if it operates versus if it chooses to shutdown?)
4. This graph represents the cost structure of a representative profit-maximizing firm that is operating in a perfectly competitive market. Use the graph below to answer the questions that follow.



- a. Suppose the market price is \$175. How many units will this firm produce? How much revenue will the firm earn? What are the firm's profits/losses?
- b. If the market price is \$125, then what is the marginal revenue of the 300th unit?
- c. Consider the following prices. Determine whether this firm will choose to operate or shutdown at these prices in the short run.
 - \$150;
 - \$100;
 - \$90;
 - \$80;
 - \$50;

At which of the above prices will the firm's losses = FC?

Consider the following prices. Determine whether this firm will choose to operate or exit the market at these prices in the long run.

- \$150;
- \$100;
- \$90;
- \$80;
- \$50;

At which of the above price will the firm's profits be normal (i.e. profit = \$0)?

5. An industry currently has 100 firms, all of which have fixed costs of \$16 and average variable cost as follows:

Quantity	Avg. Variable Cost
1	\$1
2	2
3	3
4	4
5	5
6	6

- a. The price is currently \$10. What is the total quantity supplied in the market?
- b. As this market makes the transition to its long- run equilibrium, will the price rise or fall? Will the quantity demanded rise or fall? Will the quantity supplied by each firm rise or fall?
- c. How much output will the firm produce if its fixed costs fall from \$16 to \$5? The market price is still \$10.

6. A firm in a competitive market has the following cost structure:

Output	Total Cost
0	\$5
1	\$10
2	\$12
3	\$15
4	\$24
5	\$40

- a. If the market price is \$4, how many units will the firm produce in the short run?
In the long run?
- b. If this is a representative firm in the competitive market, what will happen to the market price in the long run?

7. Ball Bearings, Inc. faces costs of production as follows:

Quantity	Total Fixed Costs	Total Variable Costs
0	\$100	\$0
1	100	50
2	100	70
3	100	90
4	100	140
5	100	200
6	100	360

- a. The price of a case of ball bearings is \$50. Seeing that she can't make a profit, the Chief Executive Officer (CEO) decides to shut down operations. What are the firm's profits/ losses? Was this a wise decision? Explain
- b. Vaguely remembering his introductory economics course, the Chief Financial Officer tells the CEO it is better to produce 1 case of ball bearings, because marginal revenue equals marginal cost at that quantity. What are the firm's profits/ losses at that level of production? Was this the best decision? Explain.