

HW Questions Chapter 9 “ Long-Run Costs and Output Decisions”

2. Ajax is a competitive firm operating under the following conditions: Price of output is \$5, the profit-maximizing level of output is 20,000 units of output, and the total cost (full economic cost) of producing 20,000 units is \$120,000. The firm’s only fixed factor of production is a \$300,000 stock of capital (a building). If the interest rate available on comparable risks is 10%, should this firm shut down immediately in the short run? Explain your answer.

5. For cases A through F in the following table, would you (1) operate or shut down in the short run and (2) expand your plant or exit the industry in the long run?

	A	B	C	D	E	F
Total revenue	1500	2000	2000	5000	5000	5000
Total cost	1500	1500	2500	6000	7000	4000
Total fixed cost	500	500	200	1500	1500	1500

9. You are given the following cost data:

q	TFC	TVC
0	12	0
1	12	5
2	12	9
3	12	14
4	12	20
5	12	28
6	12	38

If the price of output is \$7, how many units of output will this firm produce? What is the total revenue? What is the total cost? Will the firm operate or shut down in the short run? In the long run? Briefly explain your answers.

14. The following problem traces the relationship between firm decisions, market supply, and market equilibrium in a perfectly competitive market.

a. Complete the following table for a single firm in the short run.

Output	TFC	TVC	TC	AVC	ATC	MC
0	\$300	\$0				
1		100				
2		150				
3		210				
4		290				
5		400				
6		540				
7		720				

8		950				
9		1240				
10		1600				

b. Using the information in the table, fill in the following supply schedule for this individual firm under perfect competition and indicate profit (positive or negative) at each output level. (Hint: At each hypothetical price, what is the MR of producing 1 more unit of output? Combine this with the MC of another unit to figure out the quantity supplied.)

Price	Q.S.	Profit
\$ 50		
70		
100		
130		
170		
220		
280		
350		

c. Now suppose there are 100 firms in this industry, all with identical cost schedules. Fill in the market quantity supplied at each price in this market.

Price	Market Q.S.	Market Q.D.
\$ 50		1000
70		900
100		800
130		700
170		600
220		500
280		400
350		300

d. Fill in the blanks: From the market supply and demand schedules in c., the equilibrium market price for this good is \_\_\_\_ and the equilibrium market quantity is \_\_\_\_\_. Each firm will produce a quantity of \_\_\_\_ and earn a \_\_\_\_\_ (profit/loss) equal to \_\_\_\_\_.

e. In d., your answers characterize the short-run equilibrium in this market. Do they characterize the long-run equilibrium as well? If so, explain why. If not, explain why not (that is, what would happen in the long run to change the equilibrium and why?)

15. Assume that you are hired as an analyst at a major New York consulting firm. Your first assignment is to do an industry analysis of the tribble industry. After extensive research and two all-nighters, you have obtained the following information:

- Long-run costs:

Capital costs: \$5 per unit of output

Labor costs: \$2 per unit of output

- No economies or diseconomies of scale
- Industry currently earning a normal return to capital (profit is zero)
- Industry perfectly competitive, with each of 100 firms producing the same amount of output.
- Total industry output: 1.2 million tribbles
- Demand for tribbles is expected to grow rapidly over the next few years to a level twice as high as it is now, but (due to short-run diminishing returns) each of the 100 existing firms is likely to be producing only 50 percent more.
  - a. Sketch the long-run cost curve of a representative firm.
  - b. Show the current conditions by drawing two diagrams, one showing the industry and one showing a representative firm.
  - c. Sketch the increase in demand and show how the industry is likely to respond in the short run and in the long run.