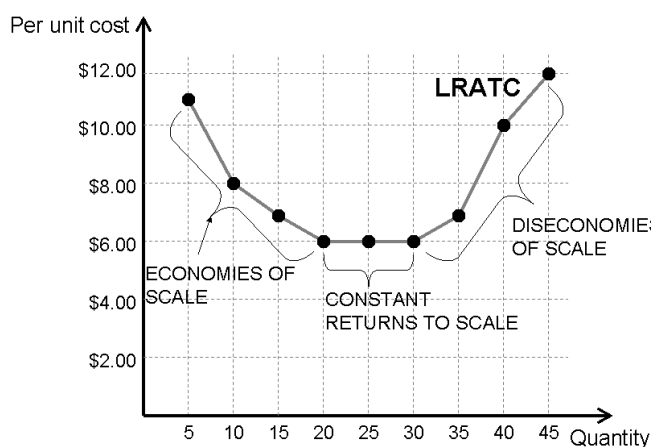


HOMEWORK VI SOLUTIONS

1. Use the following data to draw a long-run average total cost curve. Label the range of diseconomies of scale, constant returns to scale, and economies of scale.

Quantity	LRATC
5	\$11
10	\$8
15	\$7
20	\$6
25	\$6
30	\$6
35	\$7
40	\$10
45	\$12

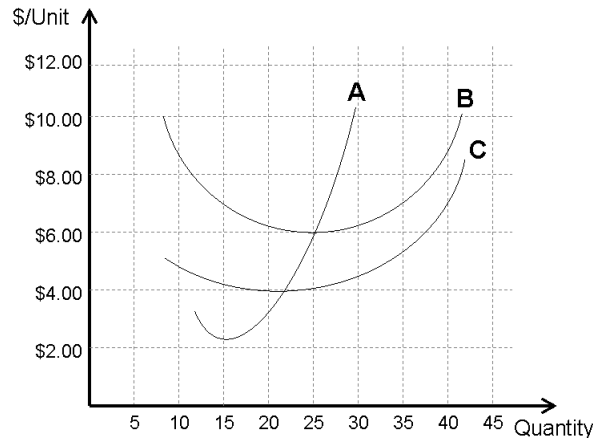
The completed graph should look like the one below.



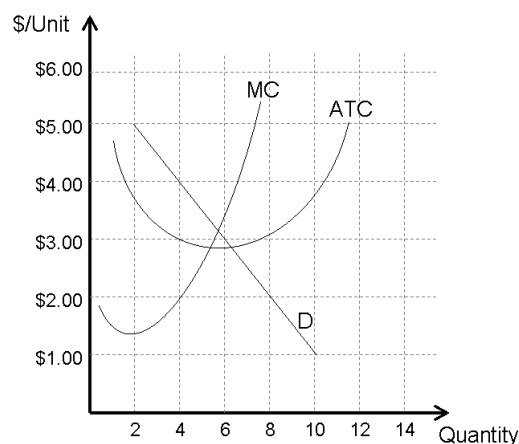
- a. What is this firm's minimum efficient level of production?
The firm's minimum level of efficient production is 20 units.
- b. What can you conclude about the short run cost of producing 25 units of output?
The short-run cost of producing 25 units must be at least \$6. If the fixed inputs are not fixed at the levels that the firm would choose in the long run for producing 25 units, then the short run costs are likely higher than \$6.
- c. If the owner of this firm told you that they were currently producing 15 units of output and that the average cost was \$7.50, what can you conclude about the technical efficiency and economic efficiency of this firm?

These costs are higher than the long-run costs, so we can conclude that the firm is not being economically efficient (it is not using the least-cost combination of inputs). However, we cannot conclude anything about technical efficiency. Though stuck with the “wrong” combination of inputs in the short run, the firm may very well be using those inputs as well as possible, thus achieving technical efficiency but not economic efficiency.

2. The following graph shows cost curves for a perfectly competitive firm in a constant-cost industry.



- b. If the market price falls below \$6 this firm will be suffering economic losses.
 - c. If the market price falls below \$4 this firm will choose to shut down in the short run.
 - d. If the market price were \$8, this firm would be earning approximately \$55: $(\$8 - \$6) \times 27.5 = \$55$, although ATC is slightly higher than \$6 in economic profit.
 - e. In the long run, this firm will produce 25 units of output.
3. The graph below represents the demand curve facing a monopolist along with the firm's average total cost and marginal cost curves.

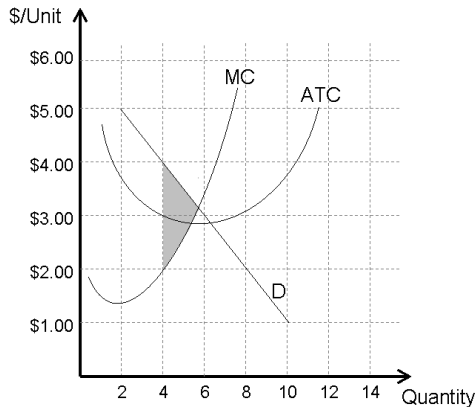


- a. What is the firm's profit-maximizing output and price?
The monopolist should sell 4 units at a price of \$4 each.

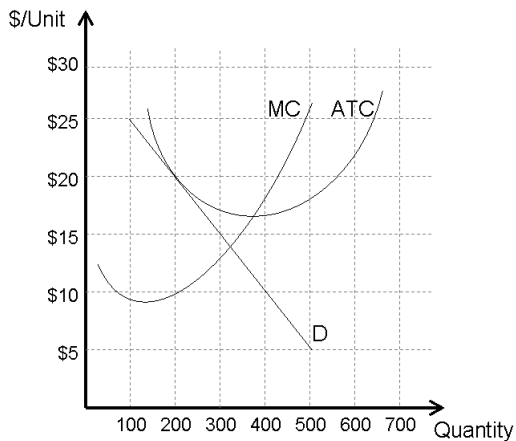
b. How much profit does the monopolist earn?

The monopolist earns \$1 of profit on each unit, for a total profit of \$4.

c. On the graph shade in the area that represents the welfare loss due to this monopoly.



4. Refer to the graph below that represents a monopolistically competitive firm to answer the following questions.



a. What is the profit-maximizing level of output?
What price will it charge?

This firm would sell 200 units at a price of \$20 apiece.

b. Is this monopolistically competitive firm in long-run equilibrium? Why or why not?

Yes, because monopolistically competitive firms earn zero economic profit in the long run, and this firm is earning zero economic profit ($P = ATC$).

5. The relationship between the variable input labor and output for a perfectly competitive firm producing socks is given below. The firm is using 4 units of capital in the production process. The prices of labor and capital (in TL. per unit) are 2000 and 4000, respectively.

Labor	Output	AP	MP	TFC	TVC	TC	AFC	AVC	ATC	MC
1	20	20	20	16000	2000	18000	800	100	900	900
2	45	22.5	25	16000	4000	20000	355.5	88.8	444.3	80
3	60	20	15	16000	6000	22000	266.6	100	366.6	133.3
4	70	17.5	10	16000	8000	24000	228.5	114.2	342.7	200
5	75	15	5	16000	10000	26000	213.3	133.3	346.6	400

b. The capacity of this firm is where ATC is minimum. It is 70 units.

c. Both diminishing AP and diminishing MP of labor set in after 45 units of output.

d. $P = AR = MR = 200$ in perfect competition. The profit maximizing condition requires $MR = MC$ and $P \geq AVC$. These conditions are satisfied at $Q = 4$.

e. $TR: 200 \times 4 = 800$; $TC: 24000$. The firm is making losses of 23200 (24000-800) TL. in the short-run.

f. The supply curve of the firm is MC curve above AVC. Therefore AVC is minimum at 88.8. MC values above that (133.3, 200,400) are relevant prices.

g. Since there are losses in the short-run, there will be exits from the industry until remaining firms are making 0 economic profits.

6. ABC is a monopoly in supplying surf boards. The firm has the following cost and demand information.

Price	Qd	Total Cost	TR	MR	MC
140	1	210	140	140	210
120	2	220	240	100	10
100	3	235	300	60	15
80	4	255	320	20	20
65	5	280	325	5	25
50	6	310	300	-25	30
35	7	345	245	-55	35

a. $MC = MR$ when $Q=4$ At $Q = 4$ $P = 80$, $TR = 80 \times 4 = 320$. $TC = 255$ Profits = $320 - 255 = 65$

b. Since this firm is a monopoly, there are entry barriers so new firms can not come. Therefore, this firm continues to operate in the long-run and make positive economic profits.