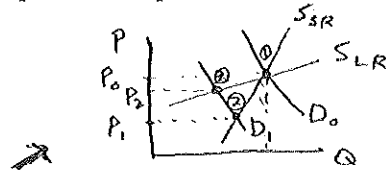


Nine questions in all, 100 points total. Questions 1-5: multiple choice, 5 points each, circle correct answer.

1. Each of the following may create a market environment where an incumbent firm may have the ability to earn persistent (long-run) economic profits except:

- A
- (a) Asymmetric information
  - b) Economies of scale
  - c) Product differentiation
  - d) Legal or regulatory barriers



2. Trapping lobsters off the coast of Maine is an increasing cost perfectly competitive industry, and is currently in long-run equilibrium. Suppose that the demand for lobsters permanently declines. We would expect that:

- D
- a) Price will decline by a small amount at first, and then more sharply later as firms make long-run adjustments.
  - b) Price will decline sharply at first, but then return to its original level as firms enter the market.
  - c) Price will rise initially as firms exit the market, but eventually return to the original equilibrium level.
  - (d) Price will decline sharply at first. As firms exit the market, price will begin to rise, but will not return to its original level.

3. Boston Beer Company has determined that own-price elasticity of demand for their premium Sam Adams lager is 5.0. Their marginal cost of producing and distributing a six-pack of beer is \$6.00. To maximize profits, they should set price at:

- B
- a) \$6.50
  - (b) \$7.50
  - c) \$9.00
  - d) \$12.00

$$P = \frac{mc}{1 - \frac{1}{\epsilon}} = \frac{6}{1 - \frac{1}{5}} = \frac{6}{\frac{4}{5}} = 7.50$$

4. Product A is peanut butter. Product B is jelly. Product C is toothpaste. There are economies of scope across the production and distribution of peanut butter and jelly. There are no economies of scope across the production of either peanut butter and toothpaste or jelly and toothpaste. Hence we would say that

- D
- a)  $TC(A, B) < TC(A, 0) + TC(0, B)$
  - b)  $TC(A, C) = TC(A, 0) + TC(0, C)$
  - c)  $TC(B, C) = TC(B, 0) + TC(0, C)$
  - (d) All of the above are true.

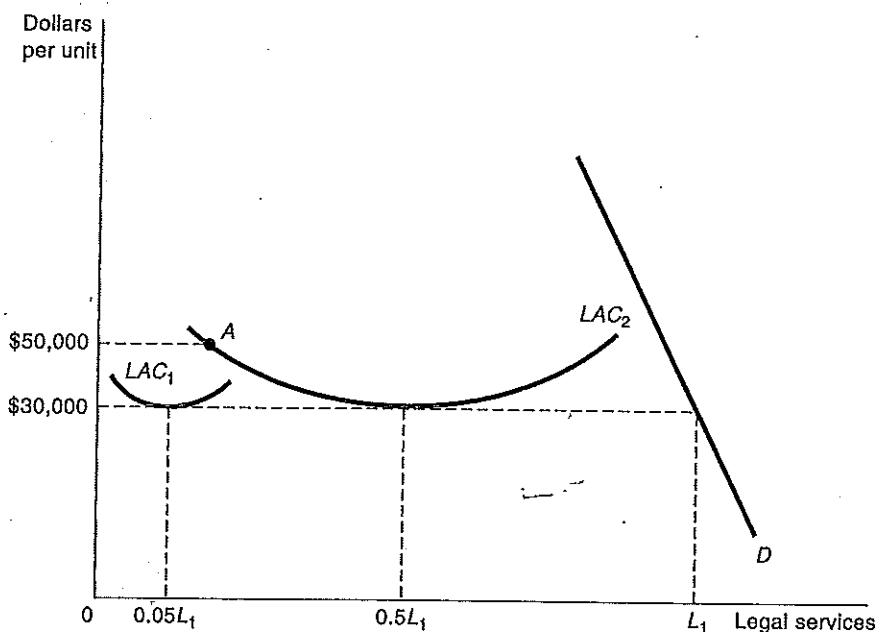
5. Demand for a monopolist is given by  $P = 85 - 2Q$ . The monopolist's total cost function is given by  $TC = 100 + 5Q$ . The profit-maximizing output and price are

- B
- a)  $Q = 10$  and  $P = 65$
  - (b)  $Q = 20$  and  $P = 45$
  - c)  $Q = 30$  and  $P = 25$
  - d)  $Q = 40$  and  $P = 5$

$$\begin{aligned} TR &= 85Q - 2Q^2 & TC &= 100 + 5Q \\ MR &= 85 - 4Q & MC &= 5 \\ MR = MC &\Rightarrow 85 - 4Q = 5 \\ 4Q &= 80 \\ Q &= 20 \\ P &= 45 \end{aligned}$$

6. (10 pts.) Suppose all firms in an industry have long-run average cost curves like  $LAC_1$  in the diagram below. What kind of market structure (i.e. how many firms) do you predict for this industry? Briefly explain your reasoning.

Minimum efficient scale (MES) occurs at an output of  $0.05L_1$ . If market price equals  $\$30,000$ , then total quantity demanded is  $L_1$ . There is room in this market for 20 efficient-sized firms.



Suppose all firms in an industry have long-run average cost curves like  $LAC_2$  in the diagram above. What kind of market structure do you predict for this industry? Explain.

MES is  $0.5L_1$ . There is only room in this market for two efficient-sized firms. Hence we predict duopoly.

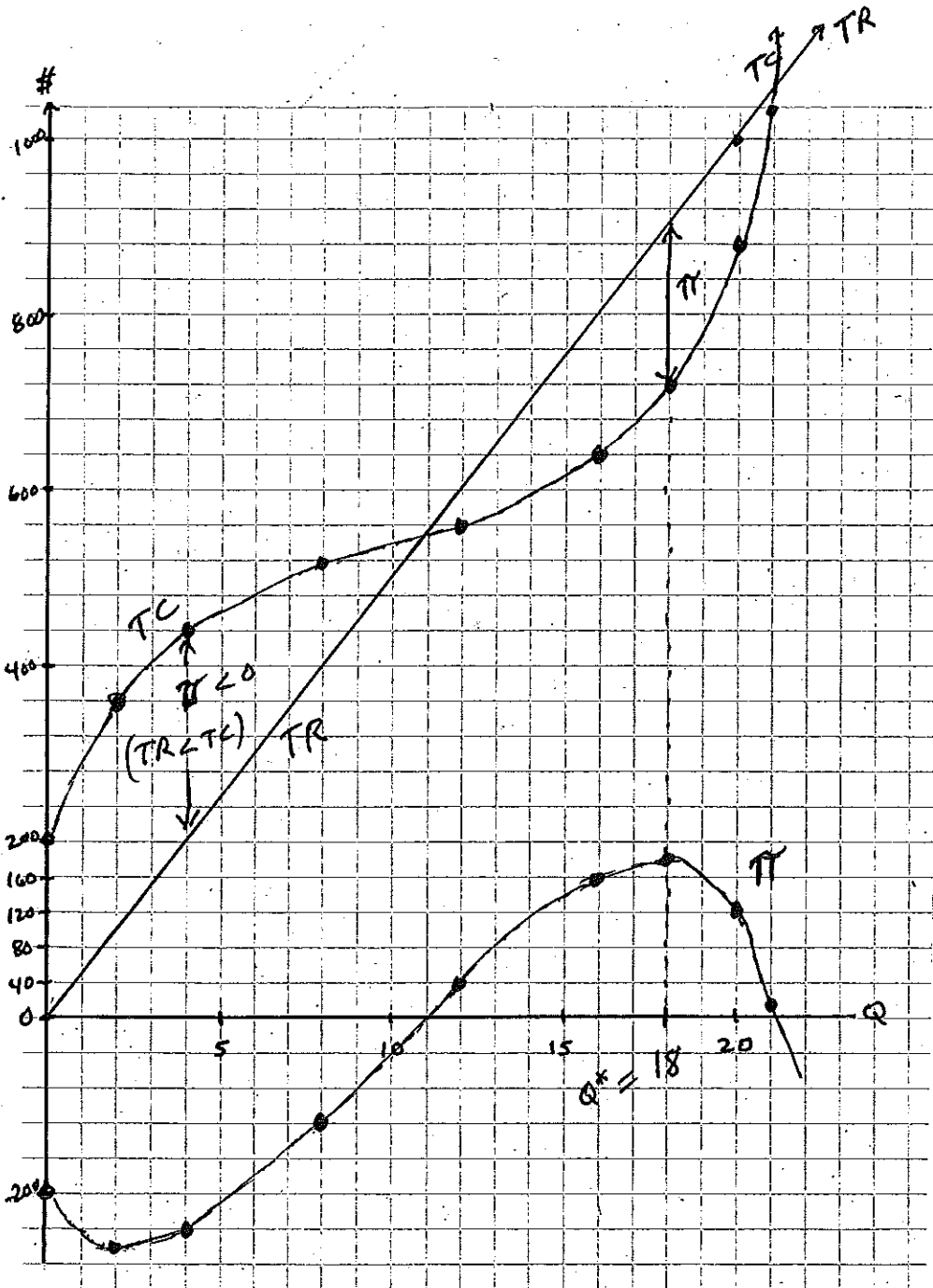
7. (30 pts.) A firm has fixed and variable costs as given in the table below:

Q	0	2	4	8	12	16	18	20	21
TFC	200	200	200	200	200	200	200	200	200
TVC	0	160	240	320	360	440	520	680	840

The firm competes in a perfectly competitive market, and currently market price is \$50.

(15 pts)

- a) Calculate points on the firm's total revenue, total cost, and profit curves corresponding to the quantities above and graph them in the diagram below. Indicate the profit-maximizing output and determine what profits will be.

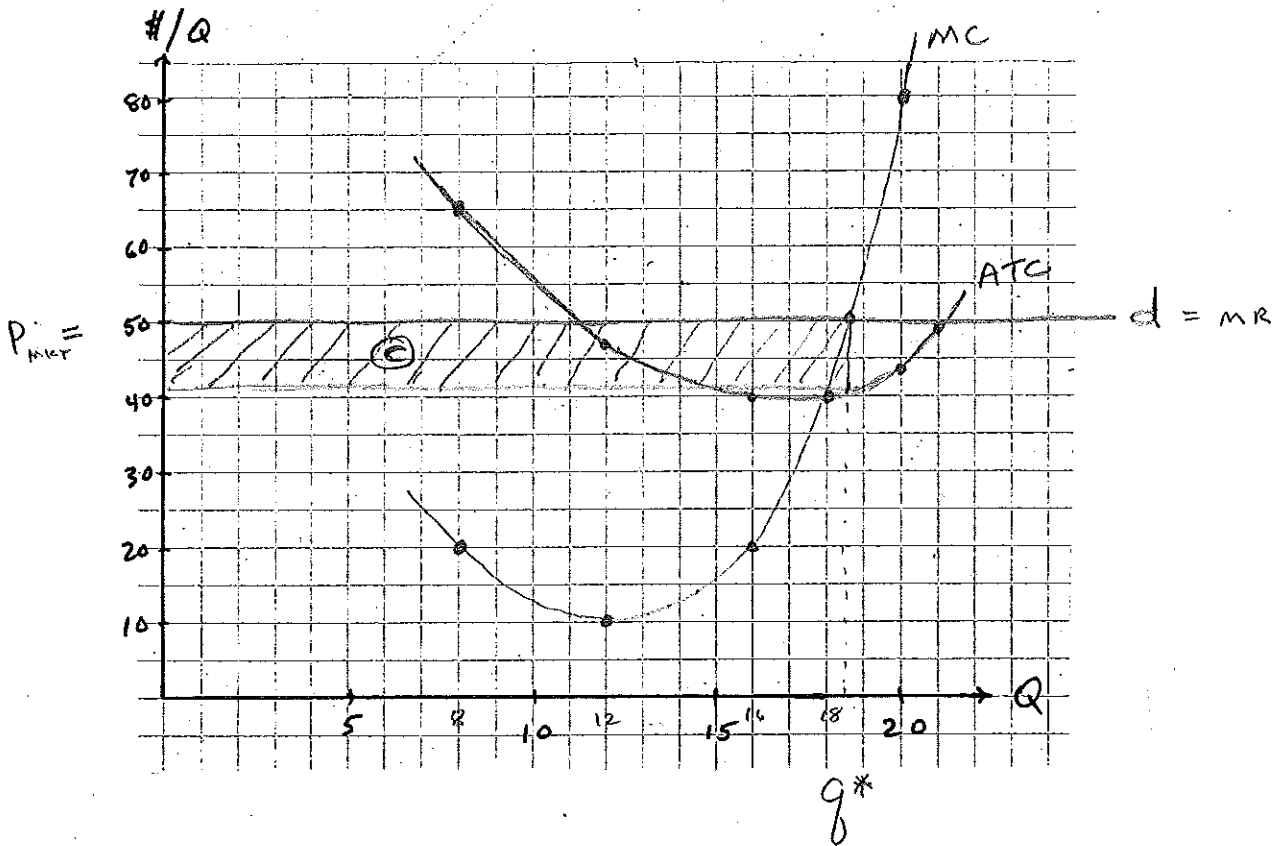


Q	TC	TR	π
0	200	0	-200
2	360	100	-260
4	440	200	-240
8	520	400	-120
12	560	600	40
16	640	800	160
18	720	900	180
20	880	1000	120
21	1040	1050	10

- b) Now calculate the firm's average total cost and marginal costs (do this for  $Q=8, 12, 16, 18,$  and  $20$ ) and illustrate the ATC and MC curves along with the firm's demand curve in the diagram below.

10 pts.

	TC	440	520	560	640	720	880	1040
Q	4	8	12	16	18	20	21	
ATC		65	46.7	40	40	44	49.5	
MC		20	10	20	40	80	160	

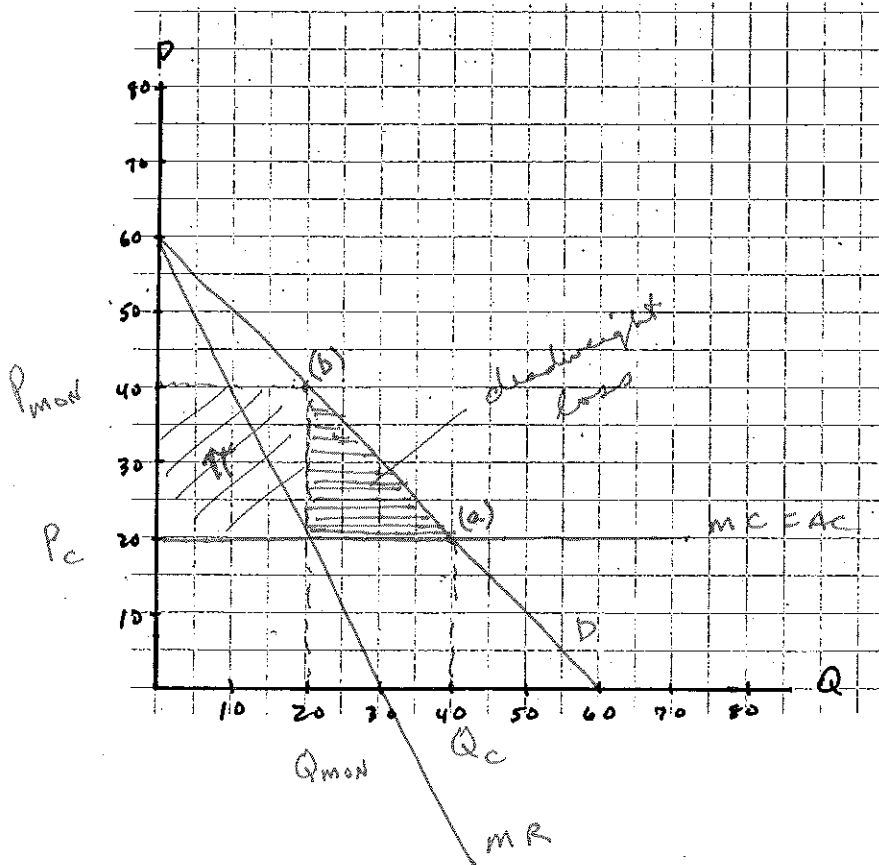


5 pts.

- c) Show the profit-maximizing output, and then show the firm's profits in your diagram.

see above

8. (20 pts.) Let the inverse demand curve for a good be given by  $P=60-Q$ . Also, suppose that the marginal and average costs of producing the good are  $MC=AC=20$ . (For this demand curve,  $MR=60-2Q$ .)
- 6 a) What price and output will result if the market is competitive? Indicate in the graph below.
- 7 b) Calculate the price and output that will result if the market is monopolized. Indicate in your graph. Also calculate and show the monopolist's profits.
- 7 c) Calculate the consumer surplus under competition. Find the welfare loss due to monopoly. Show on your graph.



$$(a) P_{comp} = MC = AC = \$20$$

$$Q_{comp} = 40$$

$$(b) P_{mon} = 40$$

$$Q_{mon} = 20$$

$$MR = MC \text{ for } \pi_{max}:$$

$$60 - 2Q = 20$$

$$2Q = 40$$

$$Q = 20$$

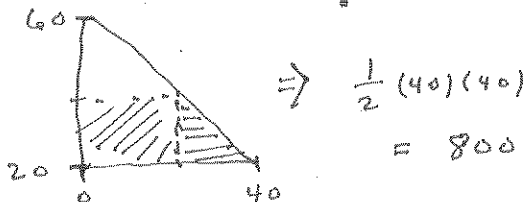
$$P = 60 - Q = 40$$

$$\pi = TR - TC =$$

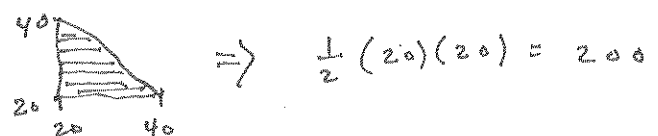
$$\pi = (40)(20) - (20)(20)$$

$$\pi = 400 = \text{shaded box}$$

(c) Consumer surplus under competition



deadweight loss due to monopoly:



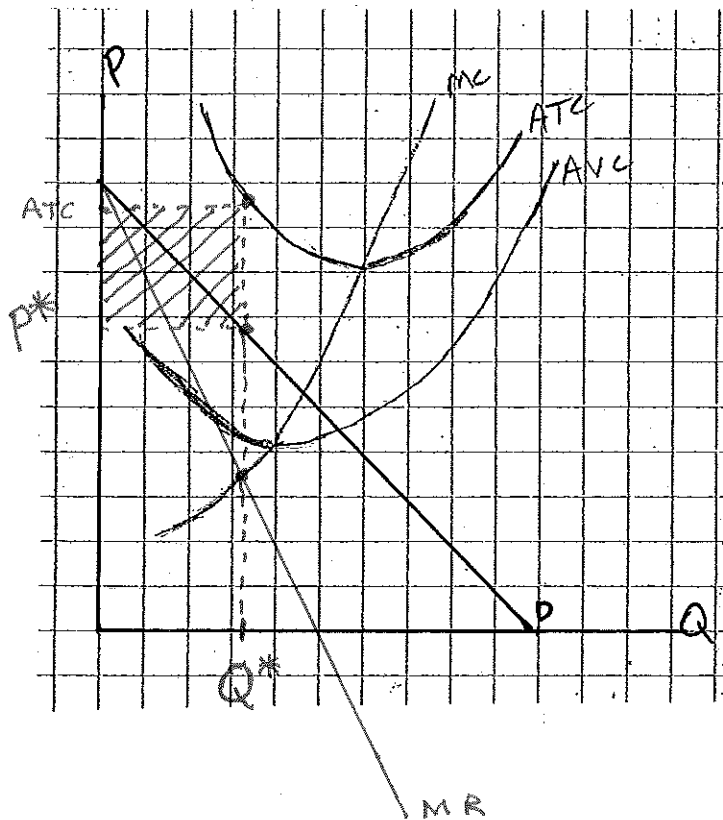
9. (15 pts.) A monopolist faces a market demand curve as shown below. Its AVC, ATC, and MC curves are also illustrated.

10

a) What output should it produce and what price should it charge in the short run in order to maximize profits? What will its profits be? Illustrate and briefly explain.

5

b) What output should it produce and what price should it charge in the long run if it expects these market conditions to persist?



(a)  $P > AVC$ , so produce  $Q^*$  where  $MR = MC$ .

$P < ATC$ , so economic profits are negative.



(b)  $\pi_{LR} < 0 \Rightarrow$  go out of business.

so  $Q_{LR} = 0$  as firm liquidates

its assets.