UNIVERSITY OF AMSTERDAM

Economics, Markets and Organizations

Tutorial 6

Continuous exam 1

- 1) How does the elasticity of supply affect the size of the deadweight loss from taxation, given a unit price elasticity of demand?

Continuous exam 2

- 2) Does a continuous increase in taxes always increase the tax revenue of the government and why/why not? Based on your answer, can you think of a country that your answer applies to?

Key objectives

- How to organize the factors of production to find the maximum output for minimum cost
  - Key concepts: isoquants, isocosts
- The producing behavior of a monopoly
- Understanding the differences of the conditions and behavior of competitive firms and monopolies

Question 1

Good A is produced by a monopolistic firm. The demand for good A is given by $P = 4 – 5Q$, where Q is the quantity demanded and P is the price for the good. The marginal cost of the firm is given by $MC = 3$.

a. What is the quantity of good A that the firm will choose to produce? What is the equilibrium price?

b. Draw a graph depicting the Average Revenue, the marginal revenue, the marginal cost, the price and the quantity maximizing the profits of the monopolistic firm.

Question 1

c. What is price discrimination? Give one example of price discrimination. How can the monopolistic firm described above extract the consumer surplus and the deadweight loss due to the inefficiency caused by the existence of the monopoly?

Question 1

a. What is the quantity of good A that the firm will choose to produce? What is the equilibrium price?

MR=MC is still the profit maximum. MC=3.

The total revenue is: $TR = PQ = 4Q - 5Q^2$

The Marginal Revenue is: $MR = \frac{\partial TR}{\partial Q} = 4 - 10Q$

So the profit maximizing output is:

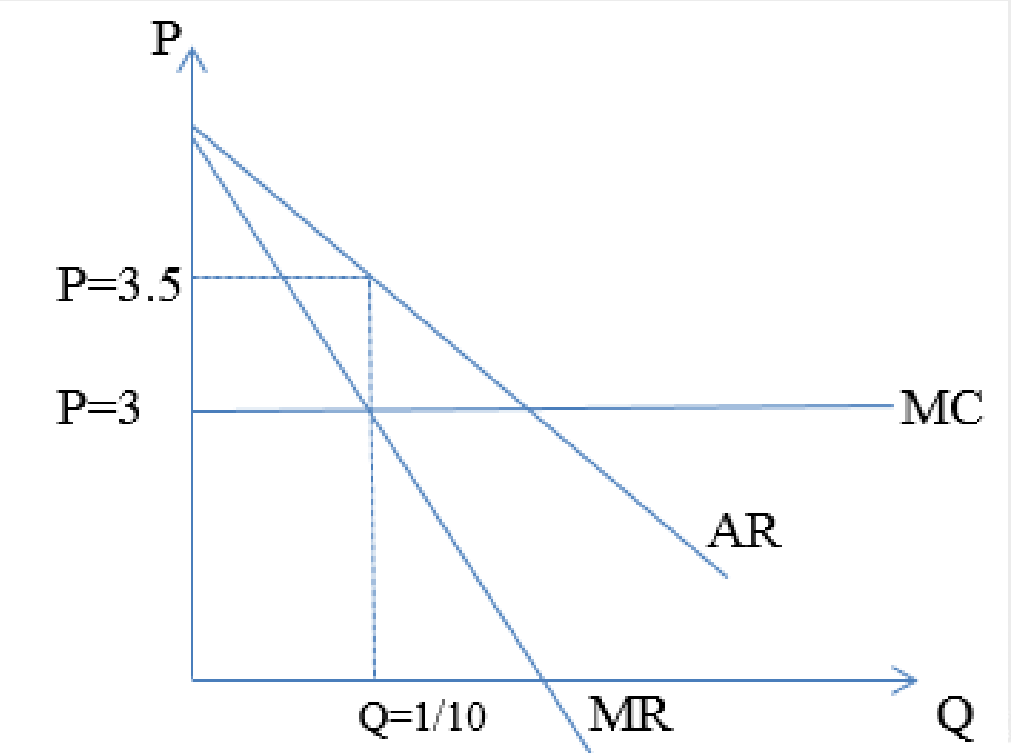
$$3 = 4 - 10Q \rightarrow Q = 0.1$$

Question 1

a. The price at the profit maximizing output is:

$$P = 4 - 5Q = 4 - 0.5 = 3.5$$

- b.:



Question 1

c. Price discrimination is the situation in which the monopolist knows the willingness to pay of each customer and can charge each customer a different price. One example is air tickets. The monopolist can extract the whole consumer surplus and the deadweight loss through price discrimination by charging a different price for each group of consumers.

Problems and applications Ch. 13

1 Isoquants are drawn as convex to the origin. Referring to the marginal rate of technical substitution, why do you think that isoquants are convex to the origin?

6 Given the total cost function $50K + 12L = TC_{KL}$, at the following total cost levels, solve for K and find the factor combinations that satisfy the equation from $K = 1$ to $K = 5$.

a. $TC = 170$
b. $TC = 510$
c. $TC = 850$

7 If a firm faced the following situation:

$$\frac{MP_L}{TC_K} > \frac{MP_K}{TC_L}$$

This is wrong!

What would be the incentives for the firm to change its production decisions? At what point would the firm stop changing its production decisions?

8 Sketch a diagram to show a firm's least-cost input combination. On your diagram show what would happen to the firm's optimum position if:

a. the price of capital increased but the price of labour stayed the same
b. the price of both labour and capital increased by the same amount
c. the price of labour and capital both increase but the price of capital increases by a greater amount than the price of labour.

Problems and applications Ch. 13

1. Because of the diminishing returns (marginal product) to the factors of production.

6. Express L from the total cost line:

$$50K + 12L = TC \rightarrow L = \frac{TC}{12} - \frac{50}{12}K$$

So if TC=170:

$$L = 14.16 - 4.16K$$

The rest you can do yourself.

K	L
1	10
2	5.8
3	1.7
4	neg
5	neg

Problems and applications Ch. 13

7. Observe that TC_L and TC_K are the prices of L and K respectively. The expression

$$\frac{MP_L}{P_L} > \frac{MP_K}{P_K}$$

states by spending one euro more on labor gives us more output than spending the same euro on more capital stock. So it is a good idea to use less capital and rather spend the money on more labor. This is until:

$$\frac{MP_L}{P_L} = \frac{MP_K}{P_K}$$

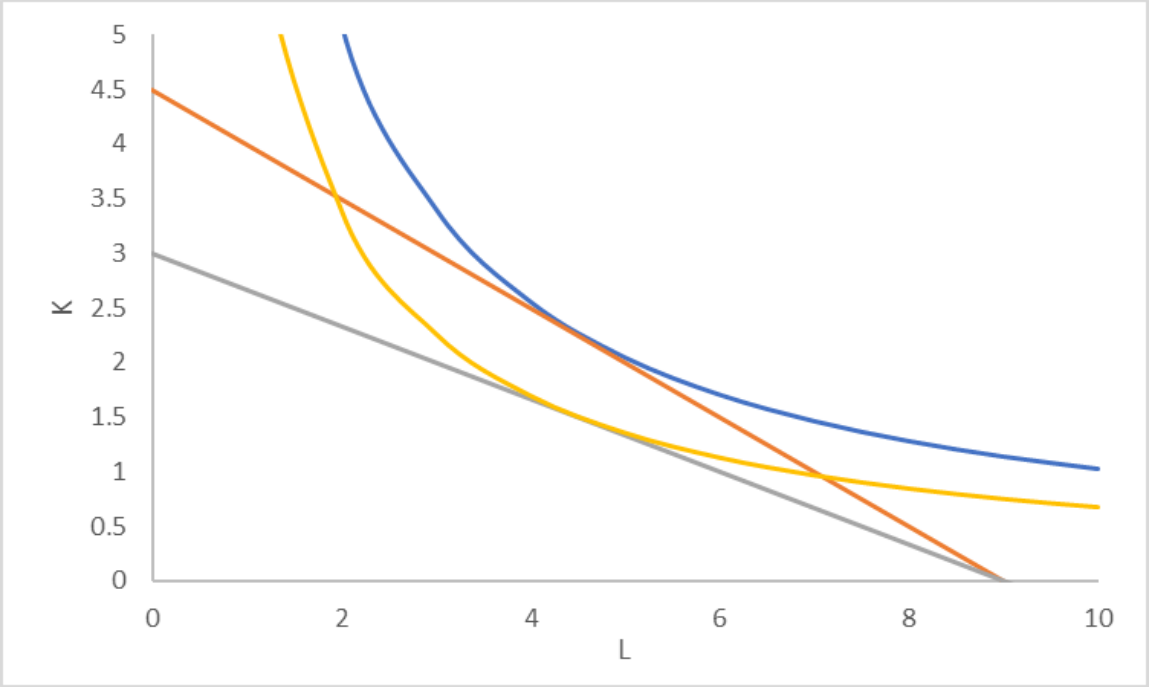
Problems and applications Ch. 13

7. cont. (some clarification)

MP_L is the output increase that you get if you increase the amount of labor by one unit. P_L is the price of one unit labor. So, MP_L / P_L is the extra unit of output that you can achieve it by spending one euro more on labor. MP_K / P_K is the extra unit of output that you can achieve it by spending one euro more on capital.

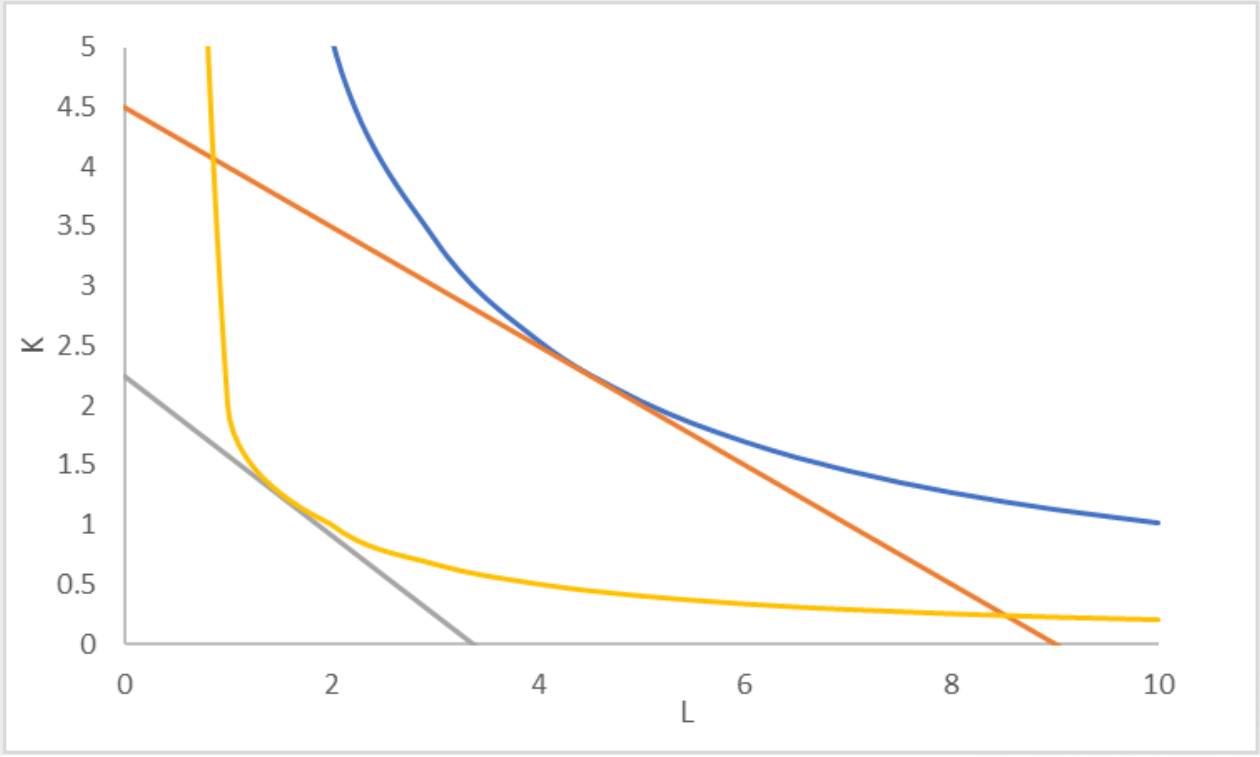
Problems and applications Ch. 13

8.a If the price of K increases, the firm will use less K and more L. It will also reduce total output:



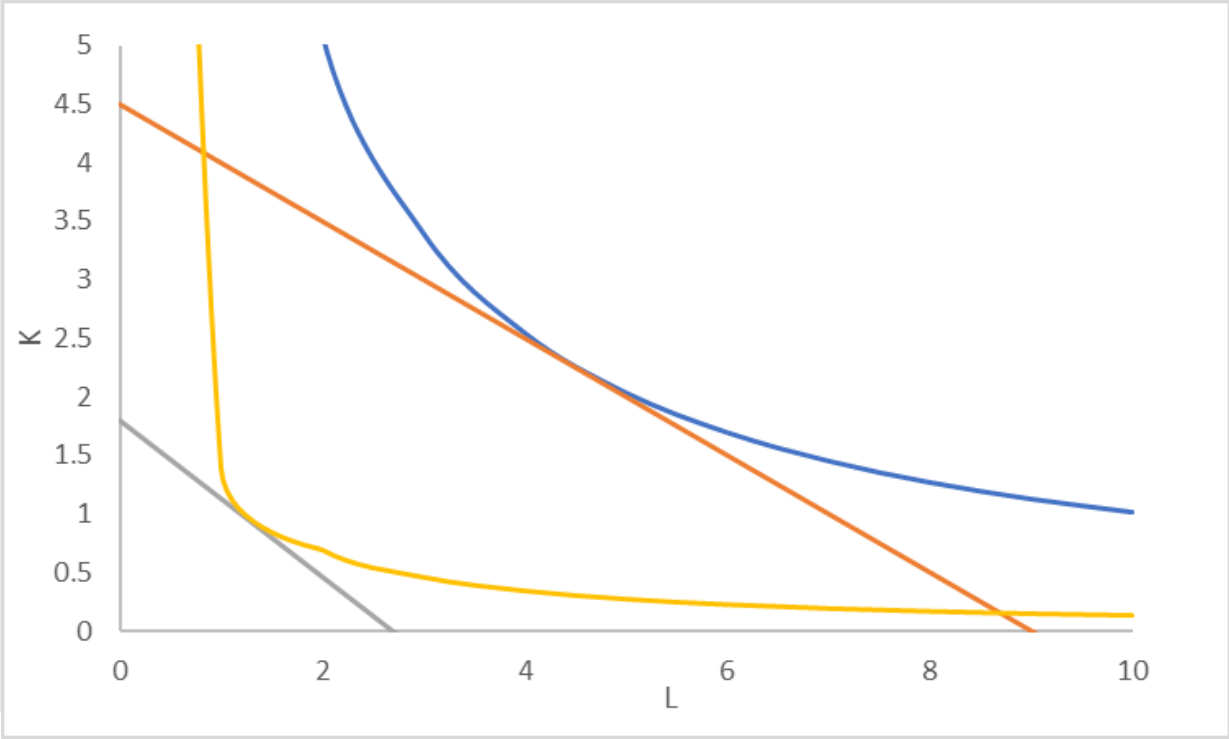
Problems and applications Ch. 13

8.b If the price of L and K increases by the same amount, we get lower output but the ratio of factors will remain the same.



Problems and applications Ch. 13

8.c If the price of L and K increases, but the price K increase more, then the K/L ratio will decrease, and output will be even lower than under point b.



Problems and applications Ch. 14

1 A publisher faces the following demand schedule for the next novel of one of its popular authors:

Price (€)	Quantity demanded
100	0
90	100,000
80	200,000
70	300,000
60	400,000
50	500,000
40	600,000
30	700,000
20	800,000
10	900,000
0	1,000,000

The author is paid €2 million to write the book, and the marginal cost of publishing the book is a constant €10 per book.

a. Compute total revenue, total cost and profit at each quantity. What quantity would a profit-maximizing publisher choose? What price would it charge?

b. Compute marginal revenue. (Recall that $MR = \Delta TR / \Delta Q$.) How does marginal revenue compare to the price? Explain.

c. Graph the marginal revenue, marginal cost and demand curves. At what quantity do the marginal revenue and marginal cost curves cross? What does this signify?

d. In your graph, shade in the deadweight loss. Explain in words what this means.

e. If the author were paid €3 million instead of €2 million to write the book, how would this affect the publisher's decision regarding the price to charge? Explain.

f. Suppose the publisher was not profit-maximizing but was concerned with maximizing economic efficiency. What price would it charge for the book? How much profit would it make at this price?

Problems and applications Ch. 14.1

a.

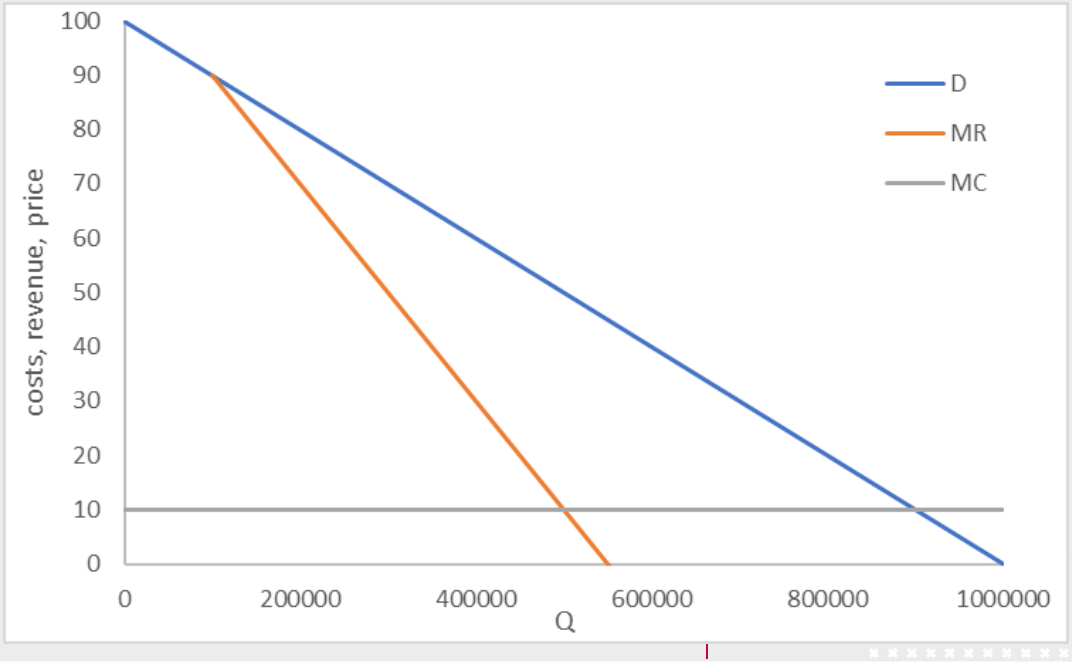
price	D	TR	TC	ATC	MR	MC	profit
100	0	0	2000000	→∞			-2000000
90	100000	9000000	3000000	30	90	10	6000000
80	200000	16000000	4000000	20	70	10	12000000
70	300000	21000000	5000000	16.7	50	10	16000000
60	400000	24000000	6000000	15	30	10	18000000
50	500000	25000000	7000000	14	10	10	18000000
40	600000	24000000	8000000	13.3	-10	10	16000000
30	700000	21000000	9000000	12.9	-30	10	12000000
20	800000	16000000	10000000	12.5	-50	10	6000000
10	900000	9000000	11000000	12.2	-70	10	-2000000
0	1000000	0	12000000	12	-90	10	-12000000

Problems and applications Ch. 14.1

a. MR=MC at Q=500,000 and P=50.

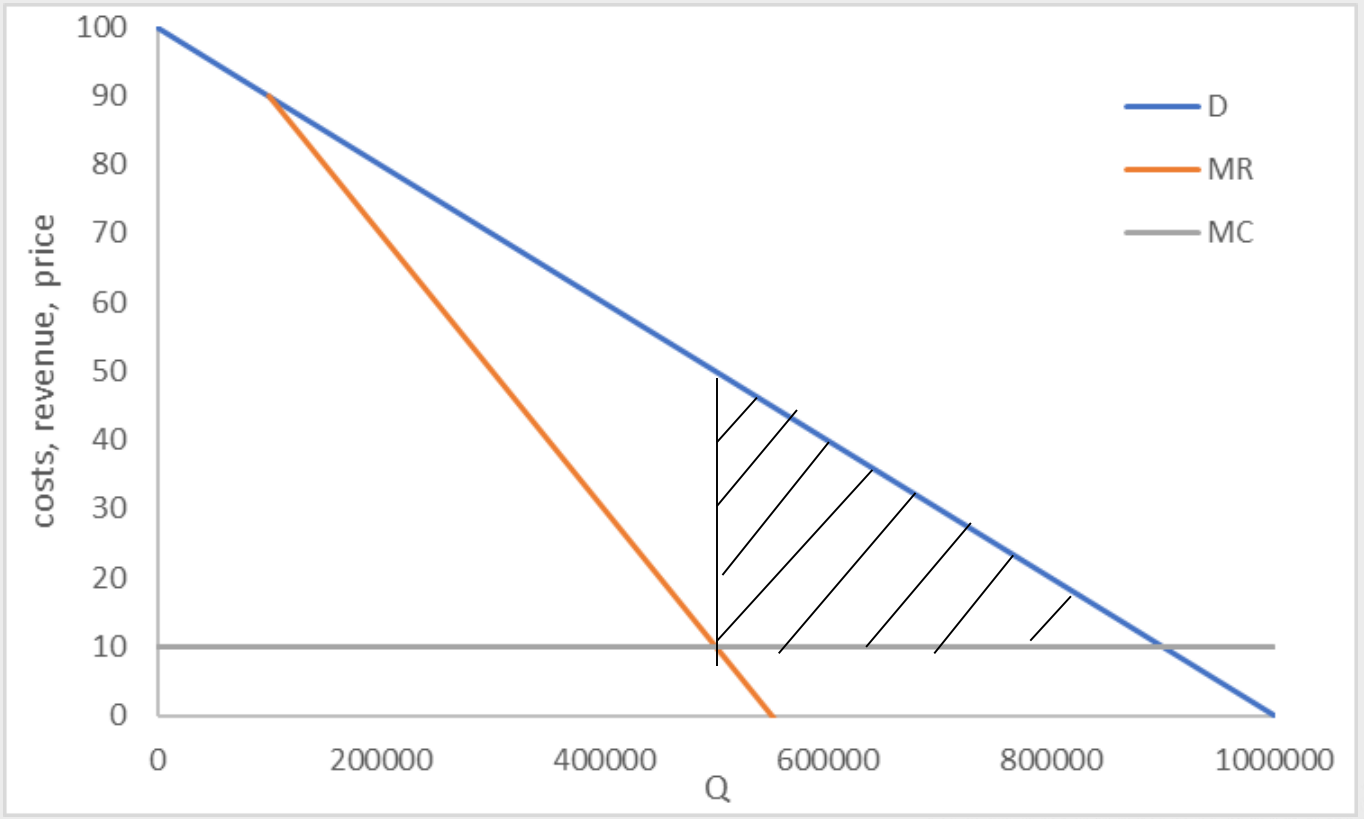
b. The MR is below the price: MR=10, P=50

c.



Problems and applications Ch. 14.1

d.



Problems and applications Ch. 14.1

d. The deadweight loss is due to the difference between the output under perfect competition and monopoly. So we need to find out how many books a perfectly competitive market would have sold. Under perfect competition, MR=AR=D, so then the perfectly competitive market would produce 900,000 books and would sell them at 10 euro. Yet, at this point the average total costs is 12 euro: the firms would make loss. This is because they would only earn enough to pay their variable costs.

Problems and applications Ch. 14.1

e. It would not change it because MC would remain the same. Thsi would reduce the profit of the firm however. Yet, even with this change in fixed costs, the profit would still be 17 million EUR.

f.Then it would produce at the AR=MC point which is where P=10 and Q=900,000. But at that price and quantity the firm would make a loss equal to the author's fee (fixed cost).

Problems and applications Ch. 14

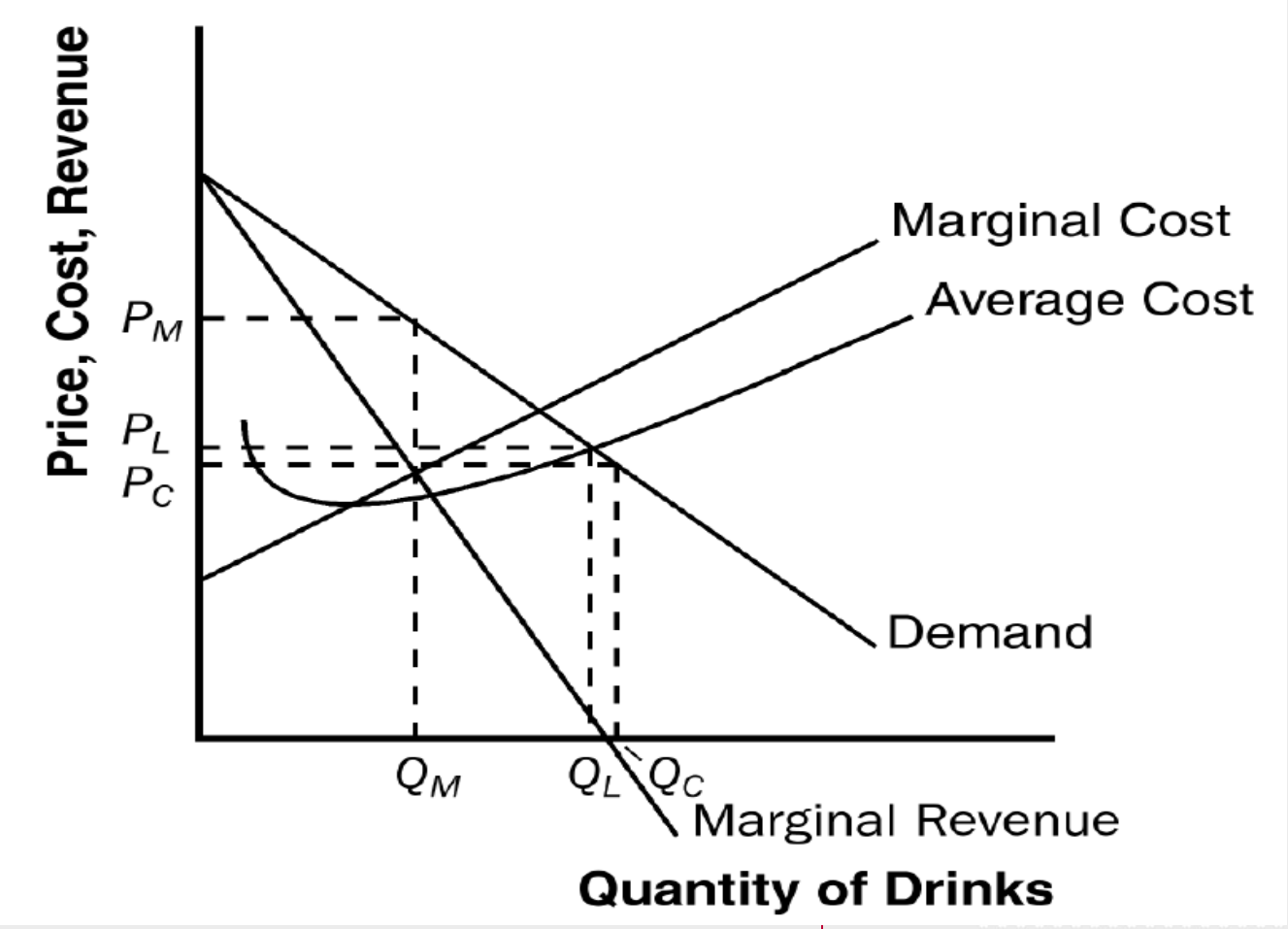
7 Pablo, Dirk and Franz run the only saloon in town. Pablo wants to sell as many drinks as possible without losing money. Dirk wants the saloon to bring in as much revenue as possible. Franz wants to make the largest possible profits. Using a single diagram of the saloon's demand curve and its cost curves, show the price and quantity combinations favoured by each of the three partners. Explain.

9 Explain why a monopolist will always produce a quantity at which the demand curve is elastic. (Hint: if demand is inelastic and the firm raises its price, what happens to total revenue and total costs?)

Problems and applications Ch. 14.7

- Pablo must choose the quantity where the price (AR,D) equal the average cost. Then he sells most drinks with zero profit.
- Dirk want maximum revenue, so he chooses the quantity at which MR=0. This is at a higher quantity than favoured by Pablo.
- Franz will behave as a monopolist, so chooses a quantity at which MR=MC.

Problems and applications Ch. 14.7



Problems and applications Ch. 14

9. First, we assume that the demand curve is a line. Then, as you increase price, the demand should become more and more elastic. As long as the price is low enough that the demand is inelastic, one % increase in price will result in a less then one % decrease in quantitiy demanded. That is, by increasing price, the firm can increase its total revenue and profit. The increase in price will only begin to reduce total revenue when the firm is at the price elastic part of the demand line. So the profit maximum must be in the price elastic part.

Question 2

a. Describe how the monopolistic firm sets its price.

b. Describe how the firm operating under perfect competition sets its price.

c. In detail describe why the monopolistic quantity is always lower to the competitive one.

Question 2

a. The monopolistic firm sets the quantity it will produce at the point where the marginal cost is equal to the marginal revenue. Then using the demand curve it finds the price corresponding to that quantity.

b. The firm operating in a perfectly competitive market does not set the price of its good. It is a price taker.

c. In monopoly AR≠MR, the MR curve will be steeper than the AR curve. As such, the MR=MC point must be at a lower quantity than in a perfectly competitive market.

Question 3

- The monopolist will never produce the competitive quantity. Discuss.

Question 3

- This is not true. The monopolist will produce the same quantity as the perfectly competitive market if it can apply perfect price discrimination, that is, if the monopolist can charge everyone their discretional price (the maximum price they are willing to pay). In this case its MR will the demand curve (AR).

Questions 4 and 5

- You can find the answer in the textbook.