

MOT1421  
Economic Foundations  
Week Two

PERFECT COMPETITION & MONOPOLY  
SELF-TEST

The self-assessment consists of 10 Questions. Each Question has a weight of 1. Your maximum score therefore is 10. A score of 6 means that you have successfully passed the test.

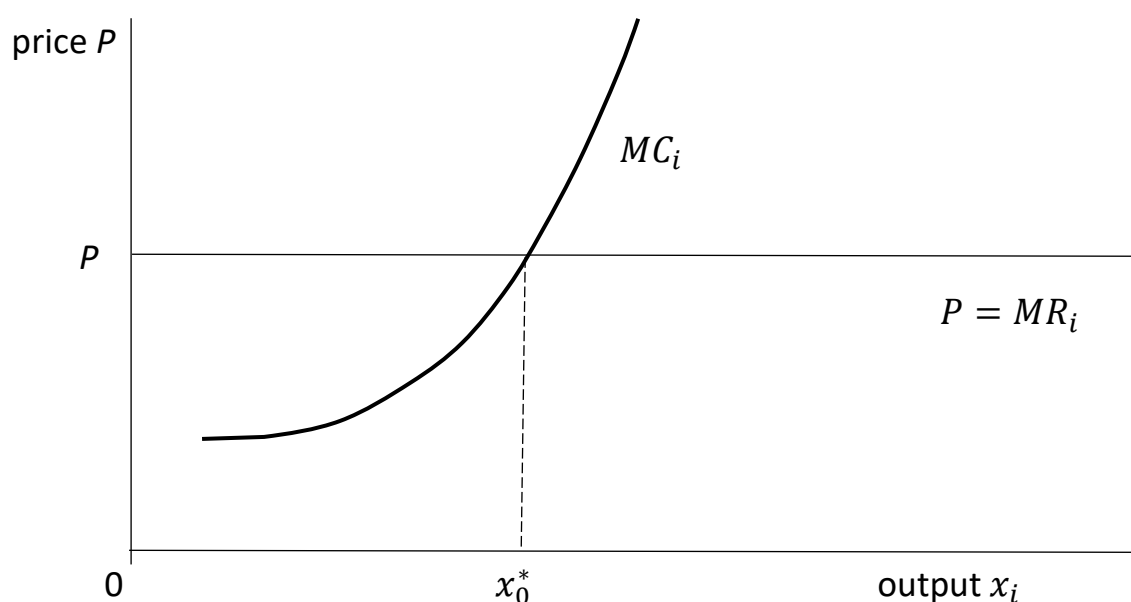
**Question 1**

In a market of perfect competition, aggregate market demand for good XYZ is given by:  $Q^D = 600 - 3 \times P$ ;  $Q^D$  is in millions of goods. Aggregate market supply is given by the following equation:  $Q^S = 200 + 2 \times P$ .  $Q^S$  is in millions of goods. All firms in this market are identical and work with the following total cost function:  $TC_i = 200 + 12 \times Q_i + 2 \times (Q_i)^2$ , where  $i$  is the  $i$ -th firm. Output  $Q_i$  is measured in 1000 units.

What is the profit-maximising level of output of firm  $i$ ? How many firms are there in this market?

## Question 2

Consider the following figure for a firm in a competitive industry:



Suppose there is technological progress which reduces average and marginal cost for all firms in this industry.

- What happens to the marginal cost curve?
- What happens to the profit-maximising level of output of each firm?
- What will be the long-run impact on (super-normal) profits of each firm?

Explain your answer.

## Question 3

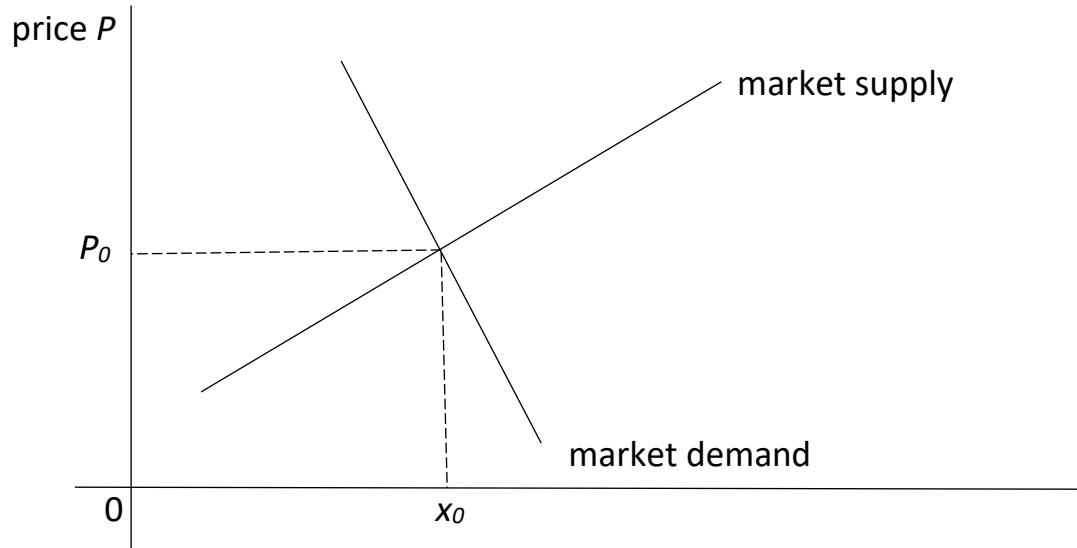
Give two examples of a market in which asymmetric information is a problem.

## Question 4

A public good is non-exclusive and non-rival. What does 'non-exclusivity' mean? What does 'non-rivalry' mean?

**Question 5**

Consider the following competitive market:



Suppose producers in this market create an external cost – in the form of pollution – and that the external damage is internalised in the costs and prices of the firms (for example, by means of a pollution tax). What happens to market supply, market demand and the market price when the external cost is internalised?

**Question 6**

A monopolist faces a demand for its product given by:  $P = 30 - \frac{1}{2} Q$ .

Its total cost takes the following form:  $TC = 10 + 2Q^2$ .

Find the monopolist's profit maximizing price and quantity. How much supernormal profit does the monopolist earn?

### Question 7

A monopolistic firm faces the following demand function:  $P = 1200 - 10 Q$ . The price is in euros. The fixed cost of production of the monopolist are 2000 euros. The marginal cost of the monopolist is:  $200 + 30 Q$ .

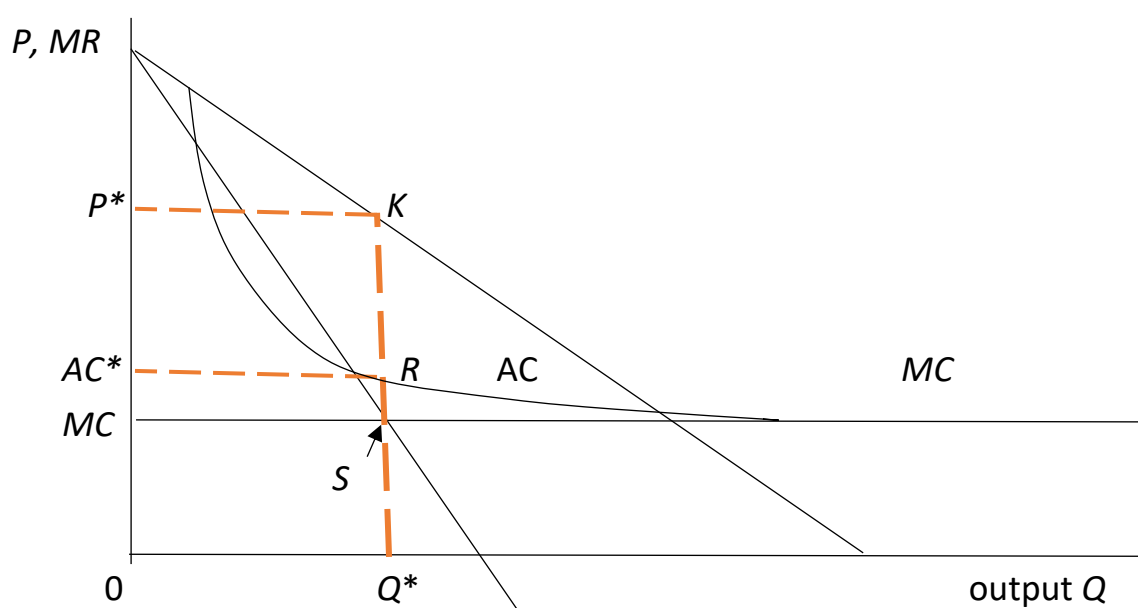
What is the profit-maximising level of output of the monopolist? What is the profit-maximising price? How big are supernormal profits?

### Question 8

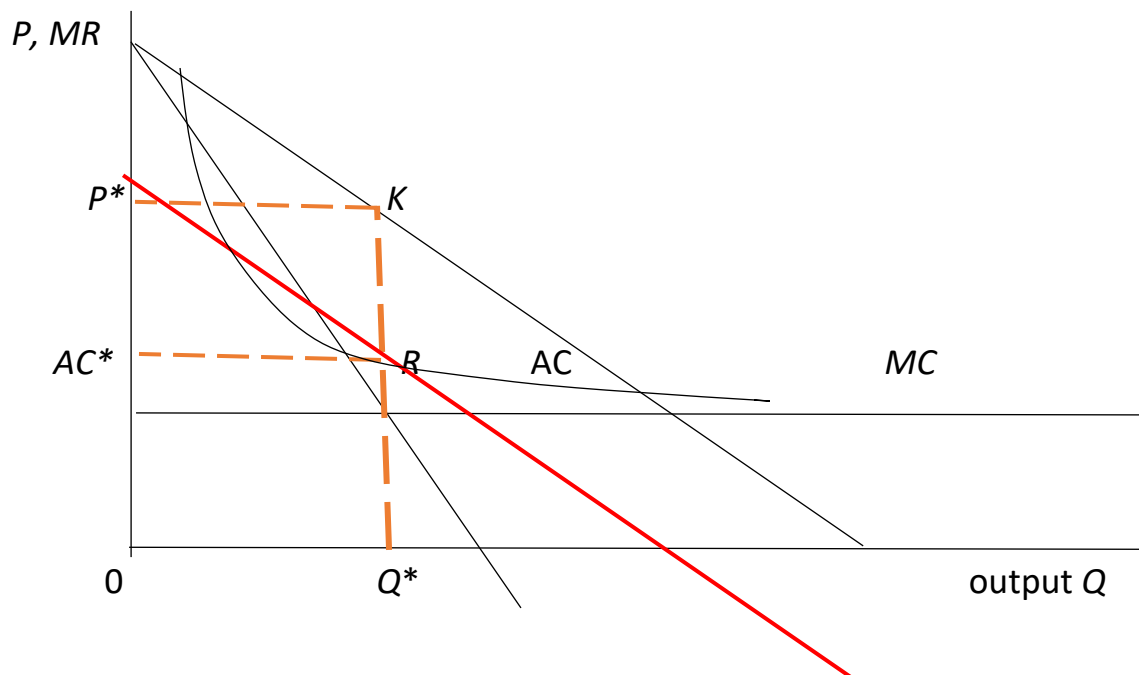
A public utility holds a monopoly on the supply of good PQR. The demand for this good is given by:  $P = 800 - Q$ . The monopolist has the following total cost function:  $TC = -2000 + 620 Q + Q^2$ . The public utility does not aim for maximum profits, but instead wants to increase supply of good PQR as much as is possible while breaking even. To break even means the firm has zero profits, because total revenue is equal to total costs. How many units of good PQR will this firm supply? What will be the equilibrium price?

### Question 9

Consider the following monopoly market:



The incumbent firm is making a supernormal profit equal to area  $P^*AC^*RK$ . Now let us assume that a big new firm enters this market. The market becomes a duopoly. The entry of the new firm leads to the following change in the graph:



Viewed from the perspective of the incumbent firm, the market demand curve shifts down (towards the origin); the red curve is the new market demand curve. The downward shift of the market demand curve reflects the fact that the entrant has “captured” a sizeable part of the market; the market for the erstwhile monopolist has become smaller.

What is the new profit-maximising level of output for the former monopolist?  
What happens to super-normal profits of this firm?

### Question 10

What is a natural monopoly?

*End of self-test Week 2*