Monopoly is one type of market structure. A firm operating in this structure is known as a monopolist. There are three conditions that must be satisfied for monopoly.

1. There is only one seller. This means that the monopolist has complete power to influence the market price.
2. The product in monopoly must be unique. Products are unique if they do not have close substitutes.
3. The monopolist is protected by barrier to entry. Firms that wish to otherwise enter the market cannot do so because of legal, financial or technological restrictions.

A monopolist is a price maker and sets the market price as there is no other firm in the market to supply the unique product.

While there are two different demand curves to consider, in monopoly, the two are the same. Since only one firm serves the industry, the demand it faces is the market demand. So the firm's demand or the demand faced by the firm is no different than the market demand. If the market demand curve is linear, the marginal revenue curve is twice as steep as the market demand and has the same y-intercept as the market demand. This is because the marginal revenue is the derivative of the market demand.

\[ MR = MC \]

As always, the profit-maximizing quantity is determined by the equation above. A monopolist always decides how much output to produce by equating marginal revenue and marginal cost. At the profit-maximizing quantity, the market demand shows the

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consumers’ maximum willingness to pay. Visually, draw a vertical line at the intersection of marginal revenue and marginal cost. When that vertical line intersects the market demand, draw a horizontal line. This horizontal line shows us the profit-maximizing price that the monopolist chooses.

Unlike in perfect competition, the quantity the monopolist decides to produce has an immediate impact on the price it must charge. Small firms in perfect competition can decide to double the quantity it wishes to produce without changing the total quantity supplied materially. One firm in monopoly cannot double the quantity it wishes to produce without changing the total quantity supplied materially. Instead, the total quantity supplied will double. This is why marginal revenue is not constant in monopoly as it is in perfect competition.

The diagram above shows demand, marginal cost, marginal revenue and average cost curves. It also shows the profit-maximizing quantity where the marginal revenue and the marginal cost are equal. Of the two prices shown in the diagram, only one is the profit-maximizing, P*. It is normal to wonder why the profit-maximizing is not P**. The demand curve shows consumers’ maximum willingness to pay. At Q*, consumers are willing to pay at most P*. If a monopolist decides to produce Q* and charge P**, the monopolist is not maximizing profit because the consumers would have purchased at the higher P*. 
In the diagrams above, the market price is higher than the average cost. For each unit, the revenue per unit exceeding the average cost per unit is the profit per unit. The profit per unit is the length of the profit box. The quantity sold is the width of the profit box. When the length and the width are multiplied, the product becomes the profit area. This profit area represents total economic profit to the firm.

This possibility of economic profit exists not only in the short run but also in the long run for monopolists. In the long run, the profit area disappears for perfectly competitive firms. When there is the possibility of economic profit, it attracts entrepreneurs who freely enter the market because there is no barrier to entry or exit in perfect competition. However, in monopoly, entrepreneurs cannot freely enter the market because there is a barrier to entry. This means that economic profit is possible even in the long run.

What exactly is a barrier to entry? Any obstacle that makes it difficult for a firm to enter a market is a barrier to entry. The barrier to entry may be created by legal restrictions, financial restrictions or technological restrictions. Common legal restrictions include patents, trademarks and copyrights. These barriers to entry hinder competition and allow for market structures like monopoly.
Recall that productive efficiency is achieved if the economy produces on the production possibilities frontier (PPF). If the production combinations are employing (1) full and (2) efficient use of available resources, they are on the PPF and are productively efficient. In other words, when output is produced at the minimum of average cost, productive efficiency is achieved. In the long run, monopolists do not produce at the minimum of average cost and thus not satisfy productive efficiency. An exception may exist where the lowest of average cost falls exactly where the monopolist maximizes profit at the intersection of the marginal revenue and the marginal cost.

Allocative efficiency is achieved if the economy produces the productively efficient production combination that the economy most desires. Price speaks to the value placed on goods and services by consumers. Marginal cost speaks to the social cost of producing goods and services. If the value placed on a particular good by consumers is higher than the social cost of producing that good \( (P > MC) \), the quantity produced is not enough for allocative efficiency. The benefit to consumers outweighs the cost to producers. If the value placed on a particular good by consumers is lower than the social cost of producing that good \( (P < MC) \), the quantity produced is too much for allocative efficiency. The cost to producers outweighs the benefit to consumers. Only when the value placed on a good or service by consumers is equal to the social cost of producing that good or service \( (P = MC) \), is allocative efficiency achieved. In monopoly, the profit-maximizing price is above the marginal cost and above the average cost. Therefore, monopoly produces too little at too high a price for allocative efficiency.

Not all monopolies are inefficient, however. A natural monopoly is an industry structure in which having one monopolist is more efficient than having many small competitive firms. One common example is a municipal electricity company. Imagine a city where there are ten firms competing to provide electricity. The ten firms need to connect all of the households and businesses to their individual electric grids. This is wasteful. Where one grid is enough to serve the electricity needs of a city, having ten is redundant.
Practice Problems

1. Which of the following most closely resembles a monopolist?
   a) Paper producer
   b) Cancer drug manufacturer
   c) Computer manufacturer
   d) Water bottling company

2. What is the difference between the demand faced by a monopolist and the market demand?
   a) There is no difference.
   b) The demand faced by a perfectly competitive firm is perfectly elastic and the market demand is less than perfectly elastic.
   c) The demand faced by a perfectly competitive firm is perfectly vertical and the market demand is perfectly horizontal.
   d) The slope of the demand faced by a perfectly competitive firm is more negative than the slope of the market demand.

3. Which of the following curves shows consumers’ maximum willingness to pay?
   a) Marginal revenue
   b) Marginal cost
   c) Supply
   d) Demand

4. Which of the following is a profit-maximizing condition for firms in general?
   a) \( P = MR \)
   b) \( MR = MC \)
   c) \( P = AC \)
   d) \( MR = AC \)

5. Which of the following is a condition for productive efficiency?
   a) \( P = AC \)
   b) \( D = S \)
   c) \( P = MR \)
   d) \( P = MC \)

6. Which of the following is a condition for allocative efficiency?
   a) \( P = AC \)
   b) \( D = S \)
   c) \( P = MR \)
   d) \( P = MC \)
7. Does monopoly lead to productive efficiency?
   a) Yes.
   b) No but with an exception.
   c) Only in the short run.
   d) Depends on the weather.

8. Does perfect competition lead to allocative efficiency?
   a) Yes.
   b) No.
   c) Only in the short run.
   d) Depends on the weather.

9. Which of the following is NOT a common legal restriction that creates a barrier to entry?
   a) Patents
   b) Trademarks
   c) Whispers
   d) Copyrights

10. Are all monopolies inefficient compared to competitions?
    a) Yes, all monopolies are inefficient.
    b) No, all monopolies are efficient.
    c) Natural monopolies are not inefficient.
    d) Depends on the weather.

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**Answers**

1. B
2. A
3. D
4. B
5. A
6. D
7. B
8. B
9. C
10. C