Profit Maximization

In order to understand profit maximization, it is important to first understand the costs of production. One key is understanding the difference between economic costs and accounting costs. Accounting costs are explicit costs of production. In other words, accounting costs consist of direct monetary expenditures. Economic costs include all accounting costs as well as implicit costs. Implicit costs are similar to the idea of opportunity cost. They include revenues that could have been received IF resources were used differently. One implicit cost is a normal profit. A normal profit is the amount of revenue that is necessary in order to keep a "self employed" resource self employed. (You might say it is the amount of money a person must make in order to stay self employed).

All profits are equal to total revenue minus total costs. An accounting profit is total revenue minus explicit costs. An economic profit is total revenue minus economic costs (both explicit and implicit costs, including a normal profit).

In economics we assume that all firms seek to maximize their profits or at least minimize their losses. In choosing a level at which to produce, a firm will produce at the quantity where Marginal revenue is equal to marginal cost (or the last point at which marginal revenue is greater than marginal cost). **THEY WILL PRODUCE HERE IF AND ONLY IF PRICE IS GREATER THAN AVERAGE VARIABLE COST. SINCE MARGINAL COST FALLS TO A MINIMUM THEN RISES, THEY ALSO CHOOSE TO PRODUCE WHERE MARGINAL COST IS RISING WHEN MARGINAL COST IS EQUAL TO MARGINAL REVENUE AT MORE THAN ONE POINT.**

If, at the quantity where MR=MC, AVC is greater than price, this means that all the variable costs will be greater than all the revenues. If the firm produces at this point, it will lose all of its fixed costs and part of its variable costs. This will not happen because a firm can shut down and lose only the amount of its fixed costs. (It would not operate at a $50 loss, when the only necessary loss is $25.)

Profits are equal to total revenue minus total costs. If this number is greater than zero, the firm has a profit. If this number is less than zero, the firm is operating at a loss. The firm will accept a short run loss as long as it can cover all of its variable costs (if price is equal to average variable cost). The point where total revenue equals total variable cost (or price equals average variable cost) is called the "Shut Down" point. We assume that a firm will produce as long as it can cover all of its variable costs, but won't produce if it can not cover all of its variable costs.

All firms use the MR=MC rule to maximize profits. The results are far different, however, when looking at a purely competitive firm and when looking at a pure monopolist.

A perfectly competitive firm has no control over market price. It can sell as much or as little output as it desires at the price that is determined by the market. They can not change market price. Any time that a firm sells more output and receives a higher price, it is not selling in a purely competitive market. Since the price a competitive firm receives is constant, any additional sales add the same amount to total revenue. Therefore marginal revenue is constant for the competitive firm and it is equal to the market price.

Since firms have freedom of entry and exit into a perfectly competitive market, there will be no long run economic profits or losses. If firms in the market are enjoying economic profits (the point at which MR=MC to the firm lies above the Average Total Cost curve), more firms will enter the market (increasing market supply) and the price will fall. This causes MR for the firm to fall, and the profit maximizing output level will be reduced. It will end up at the point where MR=MC at the minimum point on the Average Total Cost curve. At this point the firm is in long run equilibrium, there is no reason for firms to enter or to leave the market, and no economic profits are earned.

If firms are having economic losses in the short run (the point where MR=MC) lies below the ATC curve), firms will leave the market (thus decreasing market supply). This will increase the market price, and the individual firms that remain will see price go up (the MR curve shifts up on the firm's graph) and MR will eventually equal MC at the minimum point on the ATC curve which signifies zero economic profits.

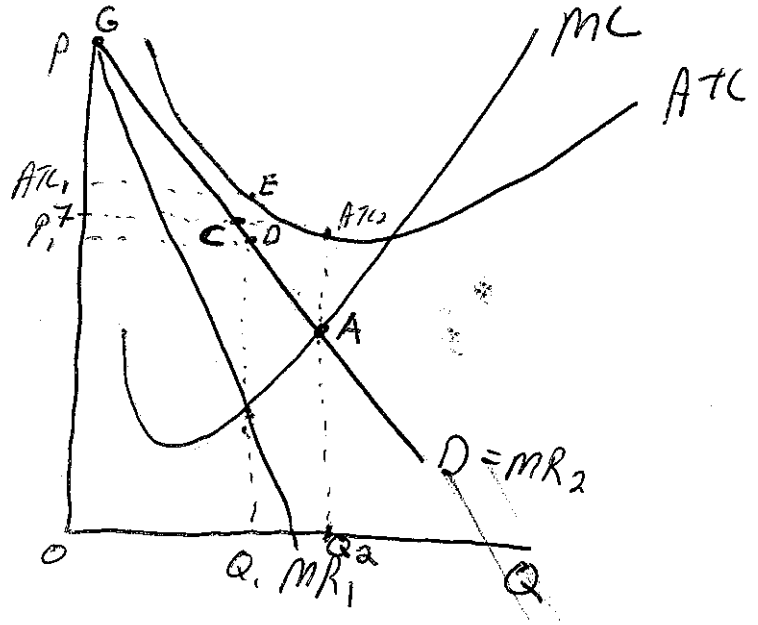
A monopolist is slightly different. The monopolist will still produce (and maximize profits/ minimize losses) at the quantity where MR=MC. However, since the monopolist is the industry, it's demand curve is downward sloping. Since a single price monopolist must lower the price to all buyers in order to sell one additional unit of output, its' marginal revenue curve is downward sloping and lies inside of the demand curve. Graphically, this quantity will be where the MR and MC curves intersect, and the price will be at the spot on the demand curve that corresponds with the quantity. The profit or loss will be the area between price and ATC (if price is greater than ATC, it is a profit, if price is below ATC it is a loss). Since there is no entry into the monopolists' market, the monopolist can sustain an economic profit.

Not all monopolists charge one price, however. When different prices are charged for the same good, and the price differential is not due to a change in costs, but due to an effort to get the maximum price every consumer is willing and able to pay, the practice is called price discrimination. This specific price is called perfect price discrimination and every buyer pays a different price. For price discrimination to be practiced a firm must have at least some Market Power (it can't be a perfectly competitive firm).

When a monopolist practices perfect price discrimination, the marginal revenue curve is the downsloping demand curve. Since every buyer pays a different price, and since the change in total revenue is equal to the new price the demand curve and MR curve are the same.

What difference does this make? For any single price firm, total revenue can be shown on a graph as the area from price to quantity (a rectangle or square) and total cost is the area from ATC to quantity (a rectangle or square), and profit or loss is the difference. For the price discriminator, however, since they receive a different price for each output level, total revenue is the entire area below the demand curve to the point where MR=MC (or the lines intersect). Total cost is still the same, but now total revenue is greater, and therefore profit is greater. It is even possible for a perfect price discriminator to make a profit where a single price monopolist would have a loss.

Consider the following graph where ATC lies above the demand curve. On this graph, if the monopolist charged a single price, MR would be MR1 . The monopolist would produce at quantity Q1 and charge price P1. Total Revenue is the area from (P1, D, Q1,O) and total cost is the area from (E, ATC1, Q1, O). Loss in this case is the area from (E, ATC1, D, P1).



If this monopolist practiced perfect price discrimination, MR is MR2. They would produce at quantity Q2. Total revenue would be the area from (G, A, Q2, O). Total cost is the area from (F, ATC2, Q2, O). Notice both areas share in common the area from (F, C, A, Q2, O). The remaining revenue is triangle (G, C, F) and the remaining cost is triangle (C, ATC2, A). Here the revenue triangle is obviously larger and the profit is the difference between the two areas or triangle (G, C, F) - triangle (C, ATC2, A).

The important thing here is that a price discriminating monopolist will produce more output and earn greater profits than a single price monopolist. From society's standpoint, since the price of the last good sold is equal to MC, allocative efficiency has also been achieved.

Here are some formulas you will need to know:

Average Total Cost (ATC)	TC/Q
Average Variable Cost (AVC)	VC/Q
Average Fixed Cost (AFC)	FC/Q
Marginal Cost (MC)	Change TC/Change Q
Total Revenue (TR)	P*Q
Total Cost (TC)	FC + VC
Marginal Revenue (MR)	Change TR/Change Q