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**Topic : Average and Marginal Revenue for a Monopolist**

### **Average and Marginal Revenue for a Monopolist**

*Imperfect competition the price is unaffected by variation in the firm's input and it follows that the addition to revenue resulting from increasing the level of sales by one more unit is the market price of that unit. Thus the marginal and average revenue curves coincide in the same horizontal straight line. In the case of monopoly, however, the average revenue curve, which is the same as the market demand curve, is downward sloping. Furthermore, the marginal revenue curve does not coincide with the demand curve: since the sale of an extra unit forces down the price at which all units already being sold can now be sold, the sale of an extra unit results in a net addition to revenue of an amount less than its own selling price.*

*It is easy to prove algebraically that, if the demand curve slopes downward, marginal revenue is always less than price. Let  $n$  and  $(n+1)$  indicate the revenue associated with the sale of  $n$ th and the  $(n + 1)$ unit. So that, eg;  $TR_n$  is the total revenue associated with the sale of  $n$  units period.*

$$\begin{aligned}
MR_{n+1} &= TR_{n+1} - TR_n \\
&= (n+1)P_{n+1} - n.P_n \\
&= n.P_{n+1} + P_{n+1} - n.P_n \\
&= n(P_{n+1} - P_n) + P_{n+1}
\end{aligned}$$

Since the demand curve slopes downwards  $P_{n+1}$  (the price ruling when  $n+1$  units are sold) will be less than  $P_n$  (the price ruling when  $n$  units are sold).

Thus, the MR of the  $(n+1)$  unit is less than  $P_{n+1}$ .

Using Calculus, the proof is as follows:

$$\begin{aligned}
&P = f(Q) \\
\text{and } &TR = Q.P = Q.f(Q) \\
\therefore &MR = \frac{dTR}{dQ} \\
&= Q.f'(Q) + f(Q)
\end{aligned}$$

But  $f(Q)$  is the price and  $f'(Q)$  is negative, since the demand curve slopes downward. Thus  $MR < P$ , and the difference is the marginal fall in price,  $f'(Q)$ , multiplied by the quantity already being sold,  $Q$ .