TOTAL REVENUE :-

⇒ It is the amount of total earning after selling the total amount of good.

The mathematical expression of the total revenue is

⇒ $TR = P.q$

P ⇒ Price of good,

q ⇒ quantity of the good sold in the market.

AVERAGE REVENUE :-

⇒ Revenue earned on per unit of selling.

The mathematical expression of average revenue is

⇒ $AR = \frac{TR}{q}$

$= \frac{P.q}{q} = P$.

⇒ Average revenue is the price of that product.

MARGINAL REVENUE :-

⇒ Amount of change of total revenue due to one unit change of quantity selling.

The expression of Marginal Revenue.

$$\frac{\Delta TR}{\Delta q} = MR$$

ΔTR ⇒ Change of total revenue

Δq ⇒ Change of selling quantity

RELATION BETWEEN MARGINAL REVENUE AND THE PRICE ELASTICITY OF DEMAND:-

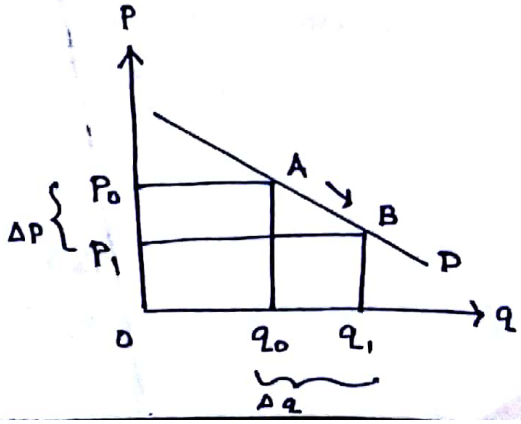
FIRST SEE THE DEMAND CURVE:-

$\Delta P = P_1 - P_0$

$\Delta q = q_1 - q_0$

(P_0, q_0) → Initial

(P_1, q_1) → Final



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(2)

Now: At the point 'A' what is total revenue ?

$\Rightarrow TR_0 = P_0 q_0$

At the Point 'B' what is total revenue ?

$\Rightarrow TR_1 = P_1 q_1$

Now if we move from 'A' to 'B' along the demand Curve then the total revenue will change from TR_0 to TR_1.

So change of total revenue will be :-

$$TR_1 - TR_0 = \Delta TR$$

$$\Rightarrow \Delta TR = TR_1 - TR_0$$

$$= P_1 q_1 - P_0 q_0$$

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(3)

Or $TR_1 = TR_0 + \Delta TR$

Now what is $TR_1 = P_1 q_1$

what is $P_1 = P_0 + \Delta P$;

$q_1 = q_0 + \Delta q$

So we can write $\Rightarrow TR_1 = (P_0 + \Delta P)(q_0 + \Delta q)$

$\Rightarrow TR_1 = P_0 q_0 + q_0 \Delta P + P_0 \Delta q + \Delta P \cdot \Delta q$

Assume that ΔP and Δq is very small;

then $\Delta P \cdot \Delta q \cong 0$

{ Change of price & change quantity is very small. }

$\therefore TR_1 = P_0 q_0 + q_0 \Delta P + P_0 \Delta q$

$TR_1 = TR_0 + q_0 \Delta P + P_0 \Delta q$

$\Rightarrow TR_1 - TR_0 = P_0 \Delta q + q_0 \Delta P$

$\Rightarrow \Delta TR = P_0 \Delta q + q_0 \Delta P$

$\Rightarrow \Delta TR = \Delta q \left[P_0 + q_0 \frac{\Delta P}{\Delta q} \right]$

$\Rightarrow \frac{\Delta TR}{\Delta q} = P_0 \left[1 + \frac{\Delta P}{\Delta q} \cdot \frac{q_0}{P_0} \right]$

$\Rightarrow MR = P_0 \left[1 + \frac{1}{\frac{\Delta q}{\Delta P} \frac{P_0}{q_0}} \right]$ $\because \frac{\Delta TR}{\Delta q} = MR$

Now $\frac{\Delta q}{\Delta P} \cdot \frac{P_0}{q_0}$ = is the price elasticity of demand at point 'A' (see the picture at page -(1))

As the price elasticity of demand is always -ve then $\Rightarrow \epsilon_p = \frac{\Delta q}{\Delta P} \cdot \frac{P_0}{q_0} < 0$

$\therefore |\epsilon_p| = - \frac{\Delta q}{\Delta P} \cdot \frac{P_0}{q_0}$ At point 'A' on the demand curve

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(4)

Therefore :- $MR = P_0 \left[1 - \frac{1}{|\epsilon_P|}\right]$

Now the general expression (At any price level)

$$MR = P \left[1 - \frac{1}{|\epsilon_P|}\right]$$

=> This is the relation between price elasticity of demand with the "Marginal Revenue".

H.W.

What will happen when

(i) $|\epsilon_P| = 1$;

(ii) $|\epsilon_P| > 1$;

(iii) $|\epsilon_P| < 1$;

in this case. (Shape of the Marginal Revenue curve)

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