

Total Revenue : $TR = P \times Q$ (Price \rightarrow quantity)

Average Revenue : $AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P$ (price)

Marginal Revenue, $MR = \frac{\Delta TR}{\Delta Q}$

(average (per unit price))

Ex: $TR = (aQ - bQ^2)$

Then: $AR = \frac{TR}{Q} = \frac{aQ - bQ^2}{Q} = a - bQ$

$AR = a - bQ$

Now suppose $Q = 10$
 $a = 3, b = 0.2$

then calculate.

$AR = 3 - 0.2 \times 10 = 3 - 2 = 1$ ans.

Total cost, TC

Average cost, $AC = \frac{TC}{Q}$ (per unit cost of production)

Marginal cost, $MC = \frac{\Delta TC}{\Delta Q}$

difference between Revenue and cost.

Profit = $TR - TC$

Change profit due to change in Q = Change in TR due to change in Q - Change in TC due to change in Q

$$\frac{\Delta \Pi}{\Delta Q} = \frac{\Delta TR}{\Delta Q} - \frac{\Delta TC}{\Delta Q}$$

$$\frac{\Delta \Pi}{\Delta Q} = MR - MC$$

How objective of firm?

\rightarrow To maximise profit.

How can a firm maximise profit?

(i) By increasing Tot Rev (TR)

(ii) By decreasing Tot Cost (TC)

maximum \Rightarrow MR is zero. i.e. it zero profit

We know TR is maximum \Rightarrow "..."
 \therefore TC is minimum \Rightarrow MC is zero
 \therefore At the point of max change in profit = 0.

$$\frac{\Delta \pi}{\Delta Q} = \frac{\Delta TR}{\Delta Q} - \frac{\Delta TC}{\Delta Q}$$

$$\frac{\Delta \pi}{\Delta Q} = MR - MC$$

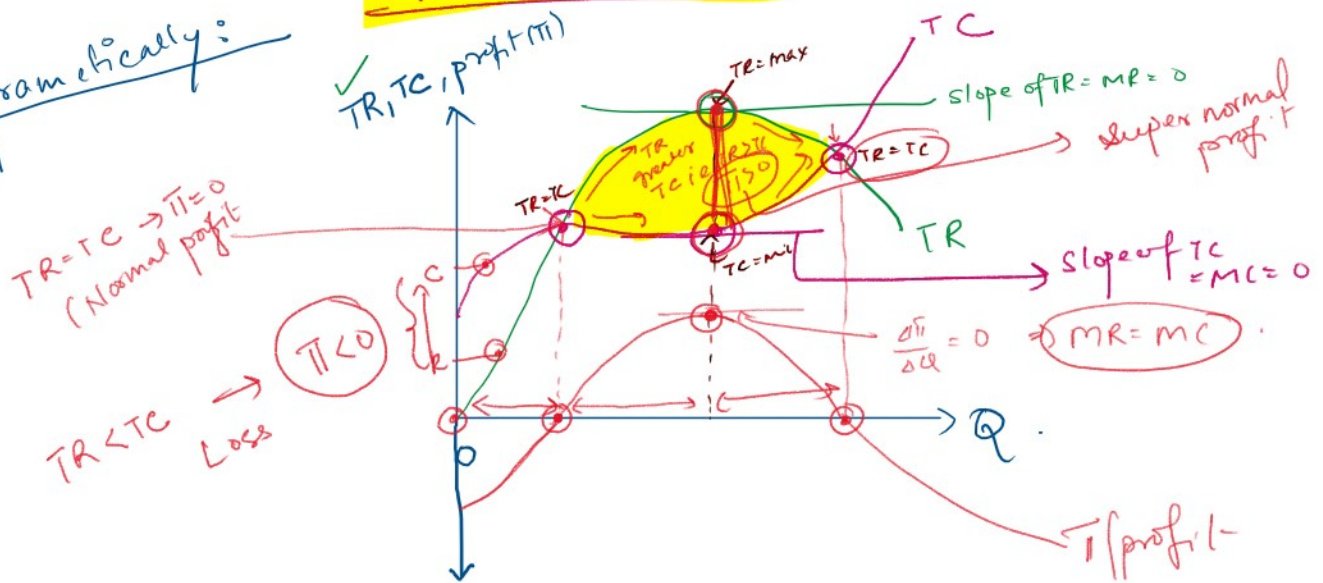
And for profit maximisation, change in $\frac{\Delta \pi}{\Delta Q} = 0$
 $MR - MC = 0$

imp condition $MR = MC$

\therefore For any firm profit maximising condition is

$$MR = MC$$

Diagrammatically:



Classification of Market

according to competition

(That is numbers of Sellers level):

① Perfect Competition:
(Infinite no. of sellers)
→ highest competition.

② Monopoly: (single seller)
→ competition zero.

③ Monopolistic Competition: [Many buyers & Many sellers (less than PC market)]

④ Oligopoly: (few sellers → relatively less competition)

Arrange these market according to the degree of competition in ascending order of competition:
[lowest competition to highest competition].

Monopoly < Oligopoly < Monopolistic competition < Perfect competition.

Degree of competition increasing →



Perfect Competitive Market:

Features:

- ① infinite number of sellers
infinite number of buyers
- ② sellers are price taker.
Prices are given/constant.
- ③ Identical or homogeneous products.
- ④ There are perfect substitutes available for each goods.
- ⑤ There are free entry and free exit of firms.
- ⑥ No advertisement costs
- ⑦ No transportation cost
- ⑧ Buyers and sellers know each other completely/perfectly
- ⑨ No government intervention.
- ⑩ Mobility of factors of production.

Difference between Perfect Competition and Pure Competition.

- ① In perf comp → factors of production are mobile (point 10)
in pure comp → factors of production are immobile (do not include)

① In perf comp \rightarrow factors of production are mobile (point 1)
In pure comp \rightarrow factors of production are immobile (do not include pt 10)

② In perf competition \Rightarrow there is perfect knowledge between buyers and sellers. (point 8)
In pure competition \Rightarrow there is imperfect knowledge. (not included point 8)

③ In perfect competition \Rightarrow not a realist model
pure competition \Rightarrow realistic.

Free entry and free exit of firms. Why?

Assumption.

① In short-run, Perf competitive market there is super normal profit
 $\checkmark (\pi > 0 \Rightarrow TR > TC)$

\rightarrow new firms will enter the market with an objective to earn profit. (max)

(In a market \Rightarrow initial condition is market is in equilibrium.
(Demand = Supply)

When these new firms enter the market, number of sellers will increase but number of buyers remain same. Then there is incidence of excess supply (i.e. Supply > Demand)

In this situation to clear market that is to bring the market back to equilibrium Demand should increase.

↳ Price will decrease in market to increase demand.

if price falls \Rightarrow what will happen total revenue will fall.

for a given $Q \Rightarrow$ if P is falling then $TR = P \times Q$ will decrease

$$\therefore \pi = TR - TC$$

so with fall in price TR decreases and increase in total cost for $Q \uparrow$.

Total profit, $\pi = TR - TC$

because $TR = TC$

$$\pi = 0 \text{ (normal profit)}$$

Any further fall in price will lead to fall in TR such that $TR < TC$ (Loss $\pi < 0$)

Conclusion:

* Due to supernormal profit $\pi > 0$ in perfect competition in short run (new firms enter freely.)

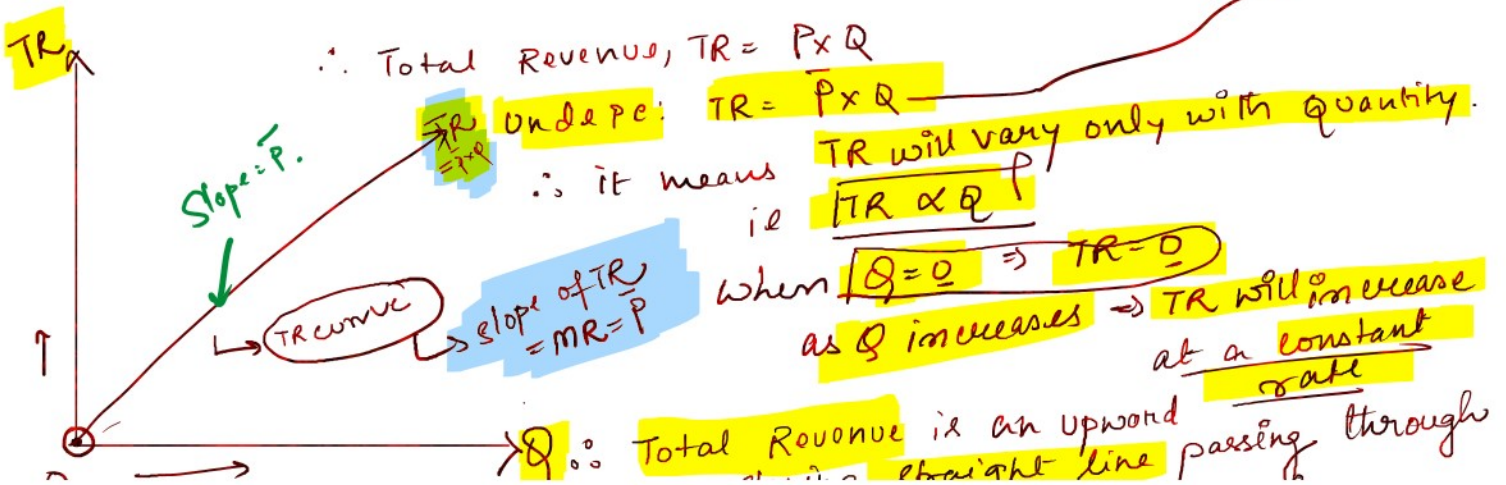
He will exit from market


* To avoid loss the firms exit the market freely and there is Normal profit ($\pi = 0$) in Long-run in perfect competition.

Very important: Revenue Curves under Perfect Competition:

under the assumption that price is given or constant in a perfectly competitive market.

Let us assume price is given/fixed at P .




 ∴ Total Revenue is an upward sloping straight line passing through the origin in a perfectly competitive market.

(2) Average Revenue curve, $(AR) = \frac{TR}{Q} = \frac{\bar{P} \times Q}{Q}$

$AR = \bar{P}$

that means in a perfectly competitive market,

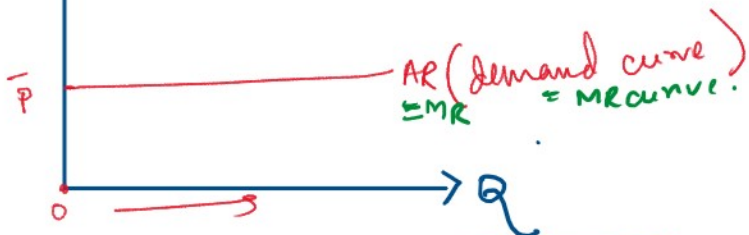
Average Revenue (AR) is fixed at \bar{P} for any level of output produced i.e., AR does not depend on Quantity (Q)

∴ AR is a horizontal curve parallel to quantity-axis.

↳ Average Revenue curve is the demand curve.

∴ In short-run, in a Perfectly Competitive market AR curve (which is the firm's demand curve) will be horizontal as shown in the diagram

AR (Average Revenue)



(3) Marginal Revenue,

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

NOTE:

Only in
Perfectly Competitive market,
 $MR = AR = \bar{P}$ (constant)

∴ In a perfectly competitive market
 $MR = \bar{P} = \text{const.}$
∴ MR is a horizontal line equal to \bar{P} .

what is TR?
In Perf Comp, $TR = \bar{P} \times Q$
Change in TR = $\Delta TR = \bar{P} \Delta Q$

$$\therefore \frac{\Delta TR}{\Delta Q} = \bar{P}$$

$$\Rightarrow \boxed{MR = \bar{P}}$$

So from (1) and (2)

$$\boxed{AR = MR = \bar{P}}$$

(very imp)

→ $MR = \text{change in } TR = \text{slope of } TR = \bar{P}$