15 November 2023 07:35 PM

Numerical on Market Equilibrium:

1. Suppose the demand and supply function of a market is given as follows.

$$Q_D = 4P + 554$$
$$Q_S = -5P + 725$$

Find out the equilibrium quantity and equilibrium price.

In equilibrium: Demand = Supply

or $\boxed{4P + 554} = \boxed{-5P + 725}$

or, $9P = 725 - 554$

or, $P = \cfrac{\cancel{171}^{19}}{\cancel{9}_{1}}$

or, $P = 19$

(equilibrium price is ₹ 19)

∴ equilibrium quantity, $Q = 4 \times 19 + 554$
$= 76 + 554$
$= 630$ units

Q2 Suppose the demand for T-shirts is given by

Q2 Suppose the demand for T-shirts is given by

$$0.7q + 3 = p$$

and supply is given by

$$-1.7q + 15 = p$$

Find equilibrium price and quantity.

Ans : $q^* = 5$ and $p^* =$

Q3. Suppose that price of a commodity falls down from Rs 10 to Rs 9 per unit and due to this, quantity demanded of the commodity increased from 100 units to 120 units.

What is the price elasticity of demand.

$Q_0 = 100 \quad Q_1 = 120, \quad P_0 = 10 \quad P_1 = 9$

Ans Change in Quantity demand $\Delta Q = 120 - 100$
$= 20$ units

Change in Price $\Delta P = 9 - 10 = -1$

$$\therefore e_p = \frac{\Delta Q}{\Delta P} \cdot \frac{P_0}{Q_0}$$

$$= \frac{20}{-1} \times \frac{10}{100}$$

$= \frac{20}{-1} \times \frac{10}{100}$

$= |-2| > 1$ elastic demand.

Q4 Suppose the initial income of a consumer a is ₹ 2000 and quantity demanded for the commodity by him is 20 units. When his income increases to Rs 3000, quantity demanded by him also increases to 40 units. Find out the income elasticity of demand.

$Q_0 = 20$ and $Q_1 = 40$

$M_0 = 2000$ and $M_1 = 3000$

$\Delta Q = Q_1 - Q_0 = 40 - 20 = 20$

$\Delta M = M_1 - M_0 = 3000 - 2000 = 1000$

$\therefore$ income elasticity of demand $= \frac{\Delta Q}{\Delta M} \times \frac{M_0}{Q_0}$

$= \frac{20}{1000} \times \frac{2000}{20}$

$= 2$

$e_m > 1 \Rightarrow$ luxury goods (Normal goods).

Theory of Cost of firm

↓

cost of production

↓

firm

inputs → Labour, Capital etc.

payments to these inputs like wages, rent etc

= cost of inputs.

∴ Labour (L) w

Capital (K) r

$$wL + rK = C \text{ (Total cost)}$$

Theory of cost two type

Short-run

Long-run

Short-run

↳ Whenever a firm uses fixed input

↓

In short-run
(there are 2 types of inputs)

1. Fixed inputs → machines, Land, buildings.
   ↳ cost incurred by firms on fixed inputs (fixed cost)

2. Variable inputs → Labour, Raw materials
   ↳ cost incurred by firms on variable inputs (variable cost).

↳ All inputs used are variable (No fixed inputs)

∴ In Short-run
Total cost (TC) = Total var cost (TVC) + Total fixed cost (TFC)

$$TC = TVC + TFC$$

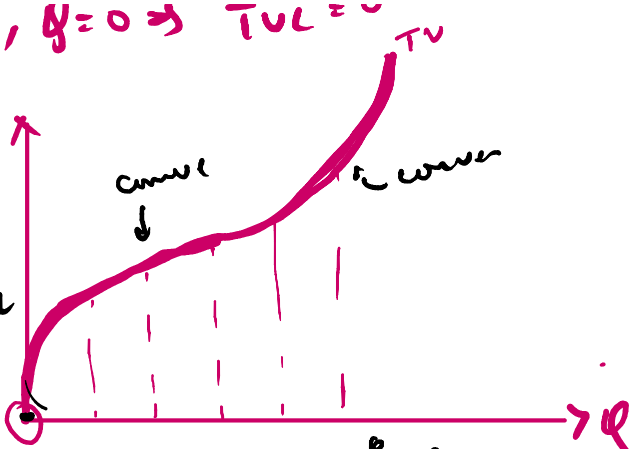
TVC: it depends on output.
i.e, $Q = 0 \Rightarrow TVC = 0$

TVC initially increases slowly with increase in production.
TVC then increases rapidly after a

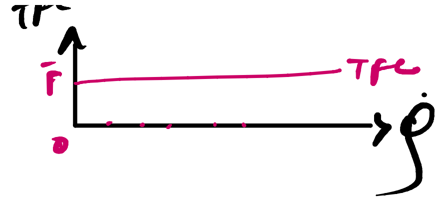
TFC: does not depend on output
TFC is horizontal to the output axis

TVC after a certain production level.

ie, $q = 0 \Rightarrow TVC = 0$



∴ TVC is first concave then convex and upward sloping through the origin.

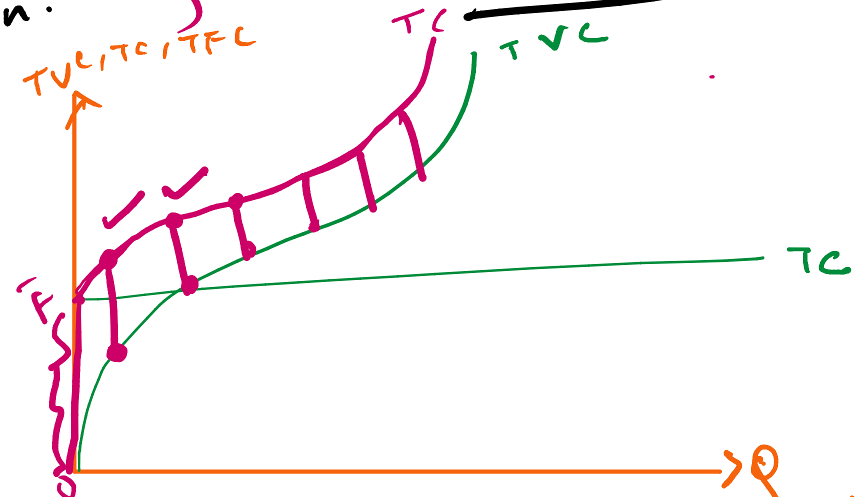


$TC = TVC + TFC$

when $q = 0$ $TVC = 0$

then $\boxed{TC = TFC}$

Now



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

$$\frac{TC}{Q} = \frac{TVC + TFC}{Q}$$

$$\frac{TC}{Q} = \frac{TVC}{Q} + \frac{TFC}{Q}$$

$$\boxed{AC = AVC + AFC}$$

$AVC = TVC/Q$

$AFC = TFC/Q$

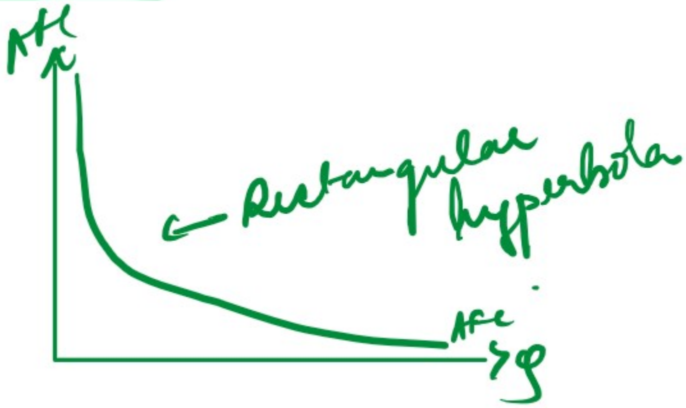
$AC = ATC/Q$

Shape of Average Cost curves

Shape of Average Cost curves

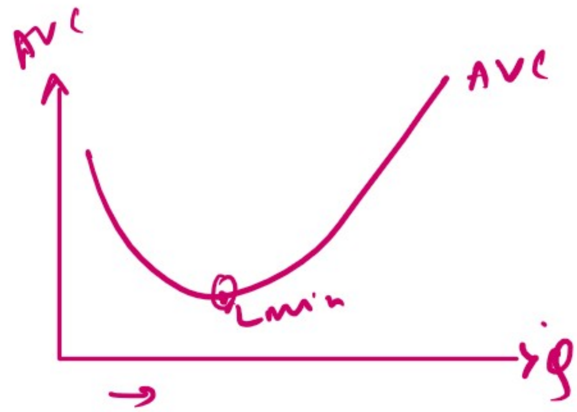
1. $AFC = \frac{TFC}{Q}$

$AFC \times Q = TFC = \overline{OF}$ constant.

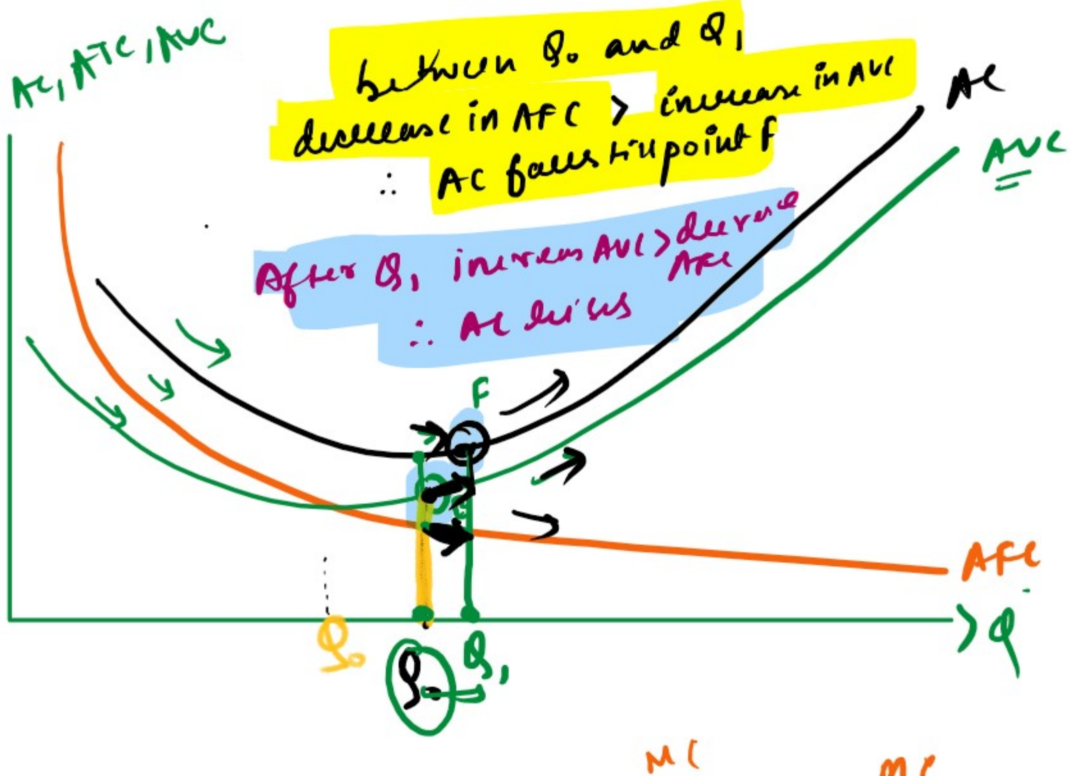


2. $AVC = \frac{TVC}{Q\uparrow} \downarrow$

(U-shaped).



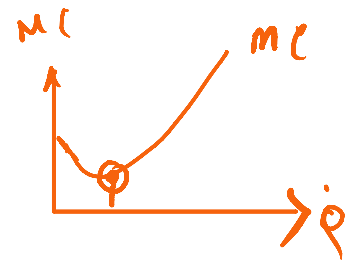
Average cost $AC = ATC + AFC$



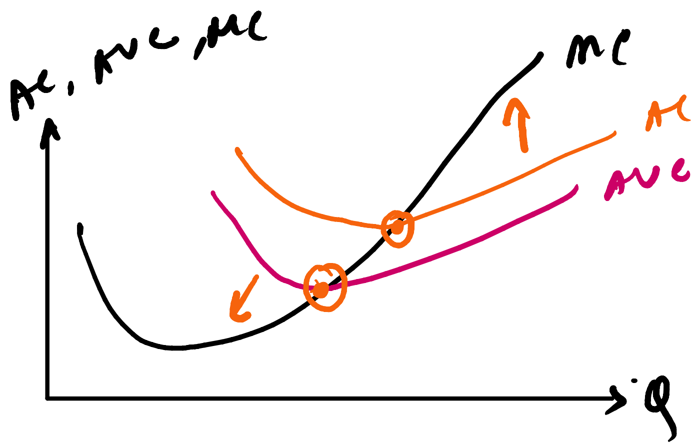
MC

MC

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



Note



AC is falling → MC < AC ✓
AC is at min → MC = AC ✓
AC is rising → MC > AC ✓