

Unit III

Production - means the creation of something.

The process of using the services of labour and equipment together with other inputs to make goods and services available. (Hyman)

Factors of Production :-

factors of production are generally grouped into land, labour and capital.

- Land means all the free gifts of nature such as minerals, forests, fertility of soil, resources of the sea etc. which can be used in the process of production.
- Labour - is a human physical effort, skill, intellectual powers etc. used for the productive services.
- Capital - it consists of those durable produced goods that are in turn used as productive inputs for further production. Categories are:
 - Structures, such as factories and homes.
 - Equipment such as consumer durable goods like automobiles and producer durable equipment like machine tools and computers.
 - Inventories of inputs and outputs such as cars in dealer's lots.

Production function

(2)

It is an economic summary or description of technological possibilities. A production function can be presented as a schedule or as an algebraic function - output dependent on possible input combinations.

$$Q = f(L, L, K, \dots)$$

Q = Quantity of output

L = Land

L = Labour

K = Capital

) quantities of factors used to produce services.

Production function refers to the technical relationship between the quantity of goods produced (output) and factors of production (inputs) necessary to produce it.

Types of Production function -

- Short Run

- Long Run

- In short run, which factor is factor and which is variable really depends on the problem ~~fixed~~ being analysed. Production can be increased only by increased the application of variable factor. Fixed factor remains constant. Once a plant is installed, it cannot be changed during a short period. When one factor is fixed then other is variable factor.

(3)

$$\text{Production function}^{(Px)} = f(L, \bar{C})$$

L = Labour is a variable factor

\bar{C} = Capital a fixed factor

- Long Run - is a long enough to increase production capacity of a firm, plant size can be changed, or more & more plants can be installed.

$$Px = f(L, C)$$

Both factors are variable.

Diff. b/w short Run & long Run production function

The laws of production -

It describes the ways which are technically possible to increase the level of production.

Law of Variable Proportions
OR

Law of Diminishing Returns

} Imp

Acc. to Joan Robinson - The law of diminishing returns as is usually formulated states that \bar{C} a fixed amount of any one factor of production, successive increase in the amount of other factors will, after a point yield a diminishing increment of the product.

Assumptions of the law

- ① During production process technology remains unchanged.
- ② Organisational setup and entrepreneurial efficiency remains unchanged.
- ③ Only one factor (labour) is variable while other factors remain fixed. This law will not be applicable if all the factors of production are proportionately changed.
- ④ All units of variable factor are homogeneous.
- ⑤ Fixed factors of production are indivisible.
- ⑥ It is related to short run only.
- ⑦ This law is concerned \bar{c} physical quantity of product only and not \bar{c} its value.

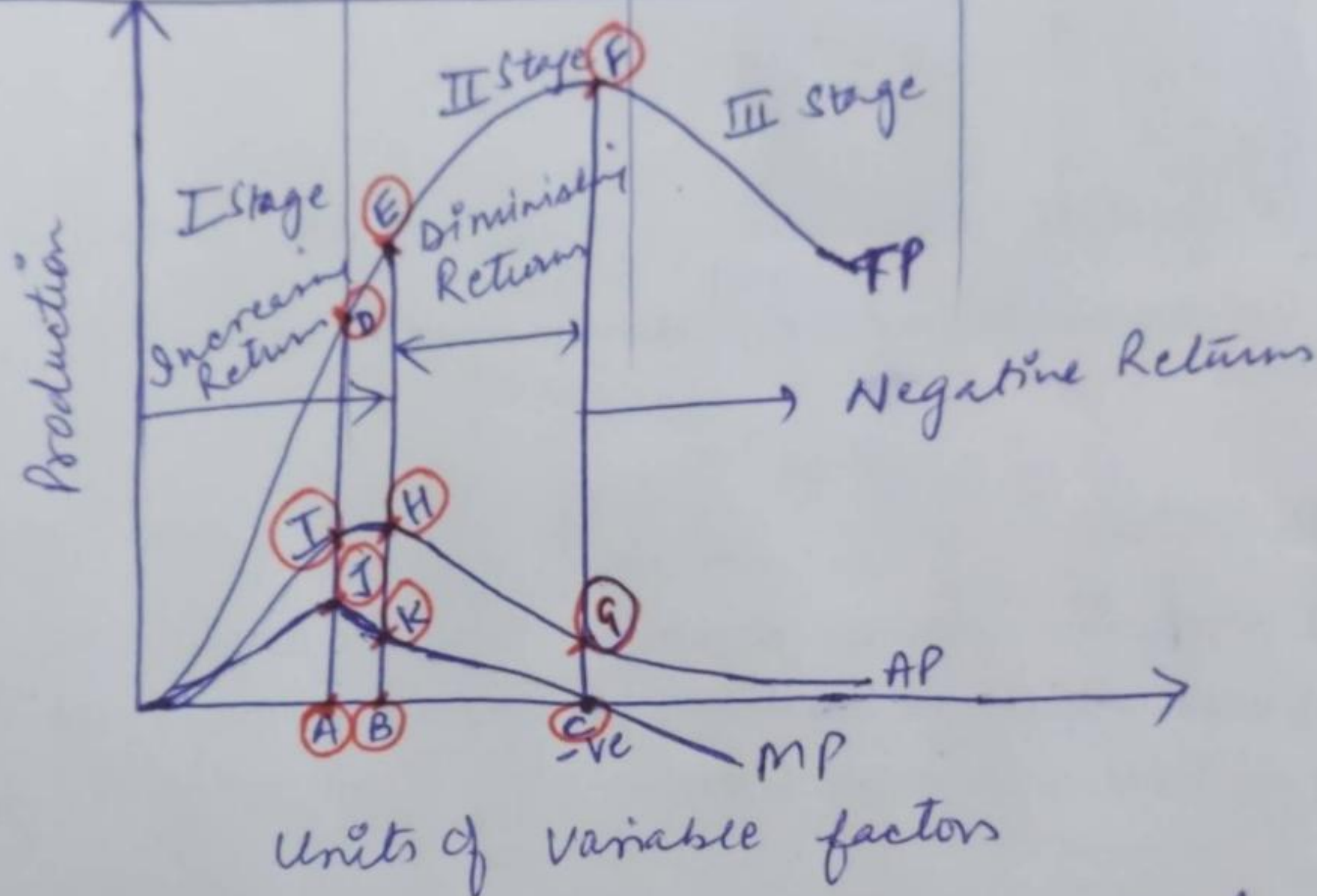
Law of Diminishing returns Includes three elements -

- TP - Total Production - Total output attained by using a certain quantity of variable factors & fixed factors of the production.
- MP - Marginal Production
- AP - Average Production

MP - is the output of one additional unit of variable factor.

$$AP = \frac{TP}{\text{Total variable factors used.}}$$

Fixed factor (Land) Acres	Variable factor (Labour)	Total Product (TP)	Average Product (AP)	Marginal Product (MP)	Stages
10	1	20	20	20	I Increasing Returns
10	2	56	28	36	
10	3	96	32	40	
10	4	128	32	32	II Diminishing Returns
10	5	150	30	22	
10	6	168	28	18	
10	7	168	24	0	III Negative Returns
10	8	160	20	-8	



After schedule & diagram, it is required to explain these two in three stages & TP, AP, and MP.

- (1) Increasing Returns
- (2) Diminishing Return
- (3) Negative return

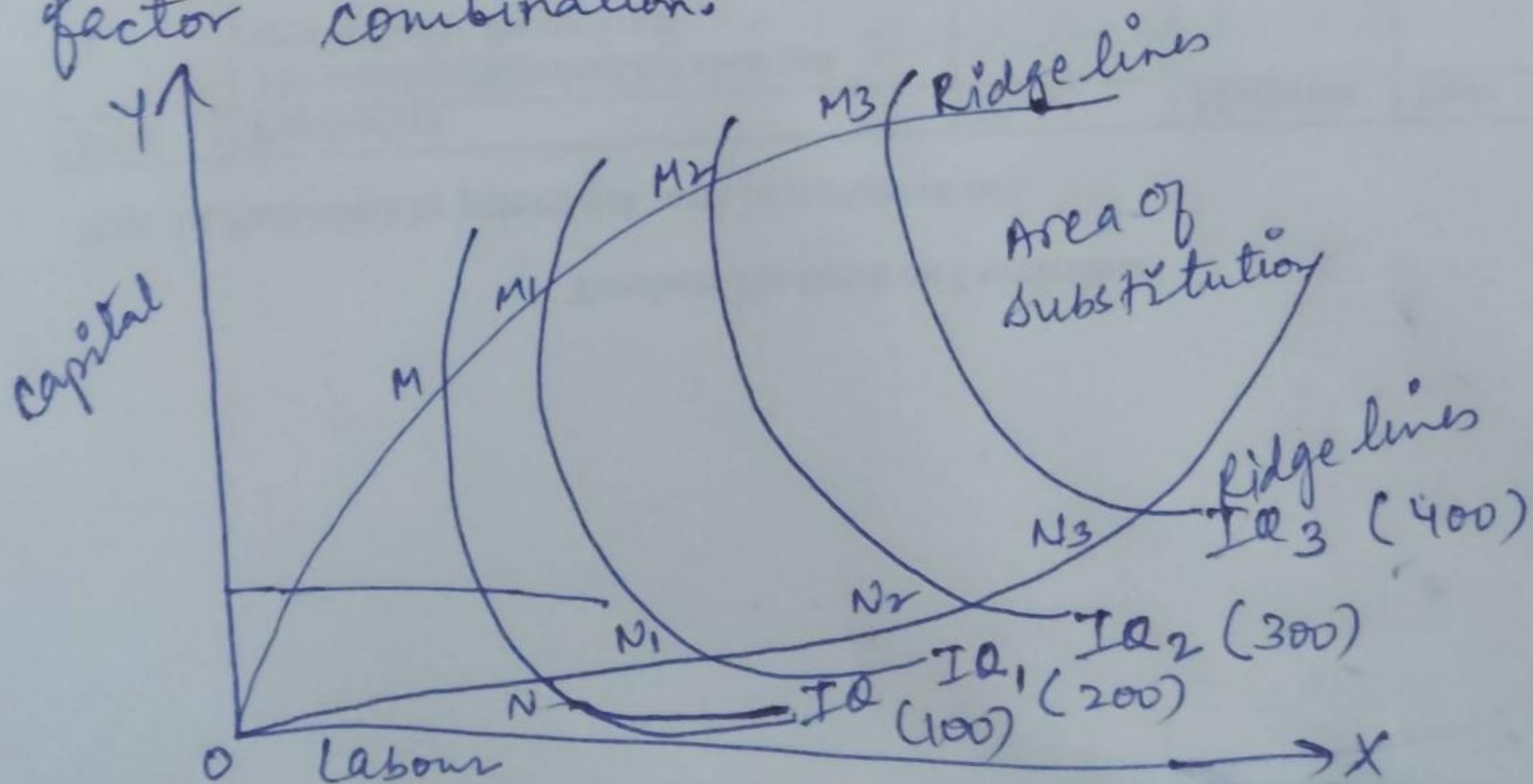
Ridge lines

An Isoquant is elliptical or oval shaped but its area of rational operation lies between ridge lines. The firm will produce only in those segments of isoquants which are convex to the origin and lie between the ridge lines.

The ridge lines are the locus of points of isoquants where the marginal productivity (MP) of factors are zero.

The upper ridge line implies zero MP of capital and

the lower ridge line implies zero MP of labour. Production techniques are only efficient inside the ridge lines. The MP of factors are negative and methods of production are inefficient outside the ridge lines. Thus, ridge lines show the economic region of production and optimum factor combination.



Economies of Scale

* Internal Economies

These economies arise from expansion of the individual firm, independently of changes in size of other firms in industry.

- Economies of In Mgmt.
- Economies in Use of factors of prod.
- Marketing Economies
- Economies in finance
- Economies of Research
- Economies of Welfare Measures

* External Economies

These arise from the expansion of the industry which reduces the costs of all firms in the industry. Industry are concentrated in one area.

- Savings in money outlays
- Technological economies
Increase in technological efficiency,
Improvement in Quality of Inputs

Theory of Costs

Unit IV

Cost means expenditure incurred by firm on ^(L, L, K) factor as well as non-factor inputs is called cost of production. (raw material)

Cost function

$$C = f(Q, T, P_f, F)$$

C = Total cost of production

Q = Output

T = Level of technology

P_f = Prices of factors

F = fixed factors

Assumptions —

- firm produces a single homogenous good with help of factors of production.
- Some factors are fixed in short period.
- Technology used for production of good is assumed to be known & constant.

Types of Costs

- Money Cost — nominal or real cost.

It means money outlays of the firm in the process of production of its output.

wages & salaries paid to labour

Expenditure on machinery, Equipments

payments for material, power, light, fuel etc.

- Real Cost
pains & sacrifices of labour as real cost.
- Implicit Cost
cost of self owned, self employed resources such as salary of proprietor, investments etc.
- Explicit Costs
are the paid out costs i.e. payments made for productive resources purchased or hired by firm.
- Opportunity Cost
cost as the value of all the things which must be foregone, lost or given up in obtaining something.
"The opportunity cost of anything is the next best alternative that could be produced instead of same factors or by an equivalent groups of factors consisting the same amount of money." (Benham)

- Total Costs
combination of fixed cost and variable cost.

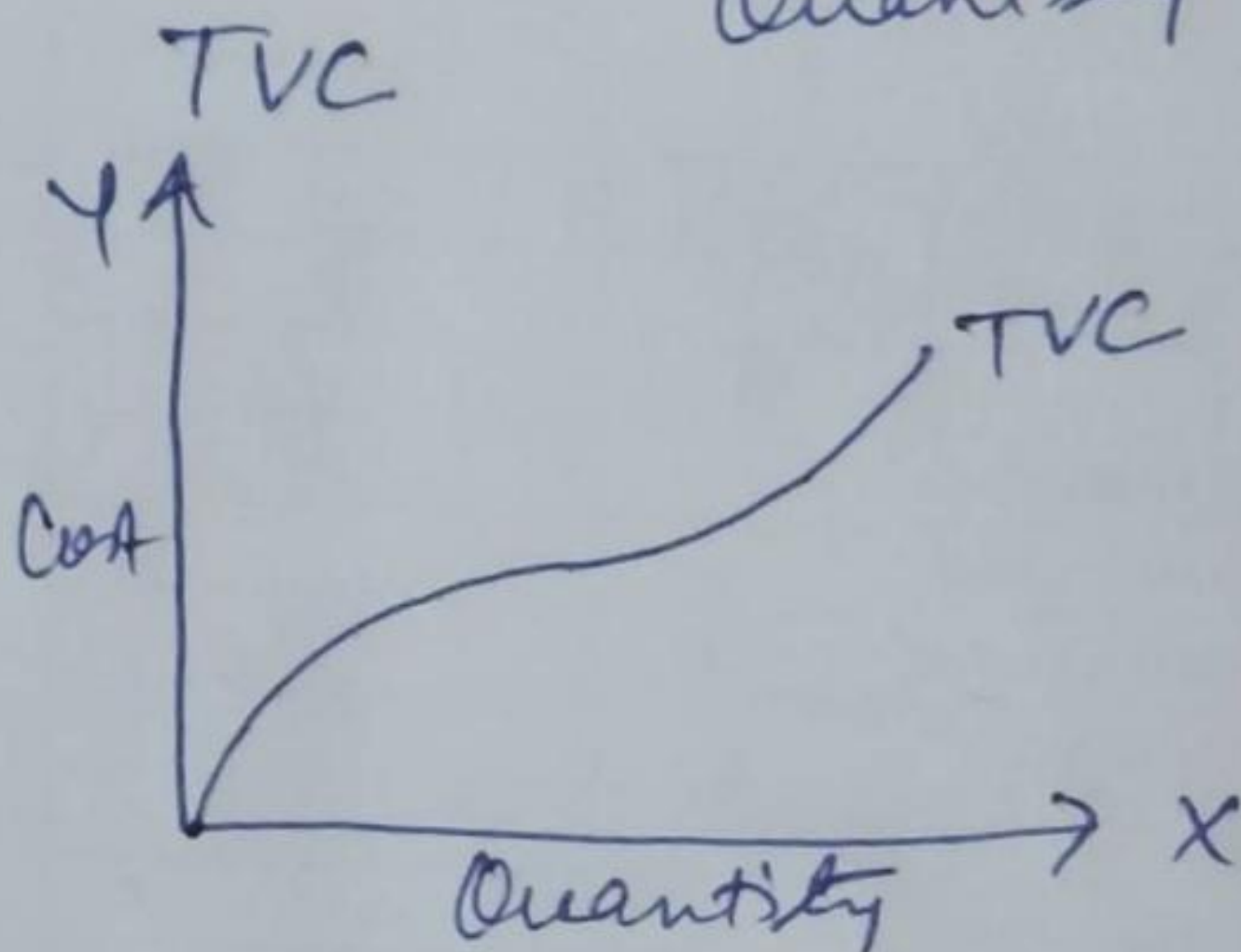
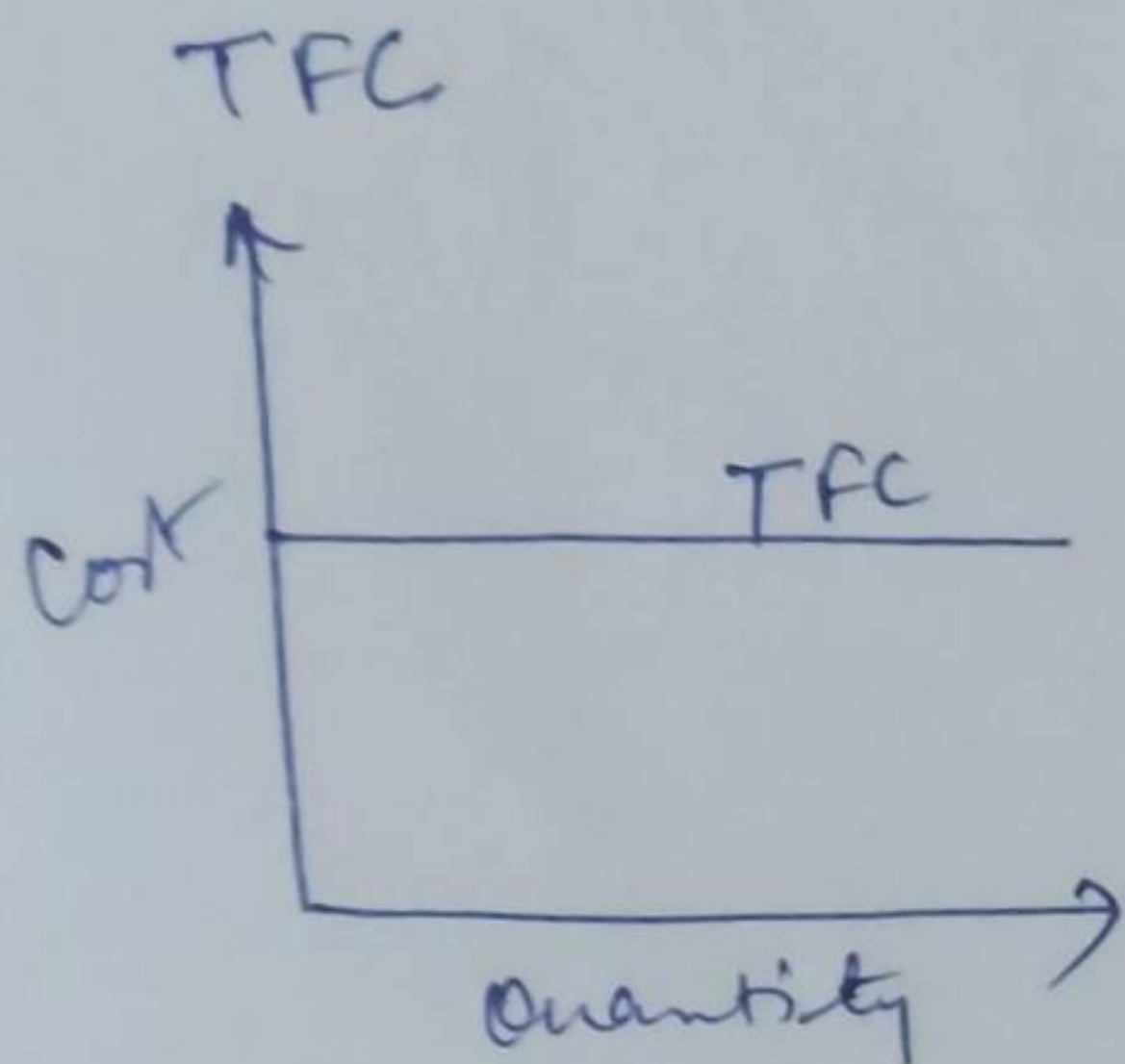
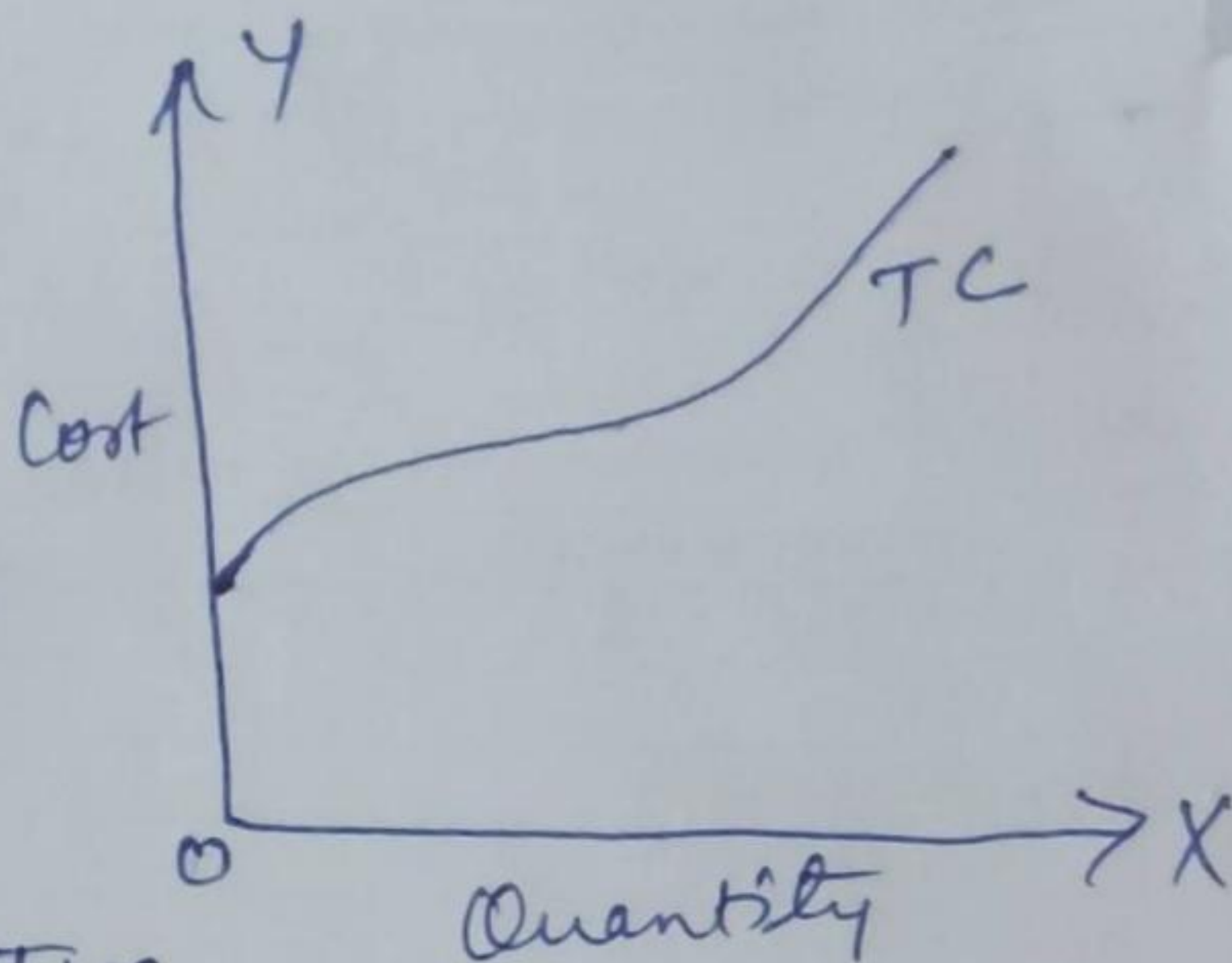
$$TC = TFC + TVC$$

total
fixed
costs

total
variable
costs

Short Run

it is total amount that it costs the firm to produce increases in output.



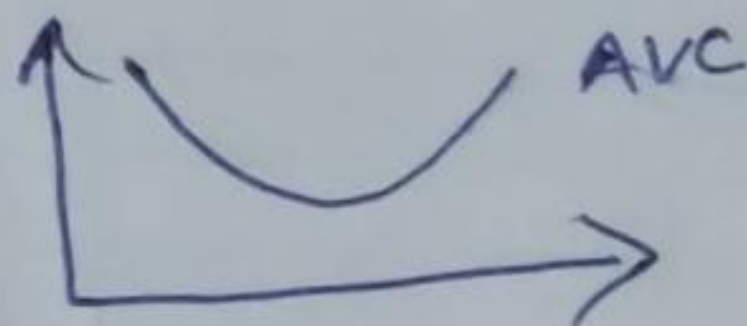
• Average Costs

$$AC = \frac{TC}{Q}$$



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

$$AVC = \frac{TVC}{Q}$$



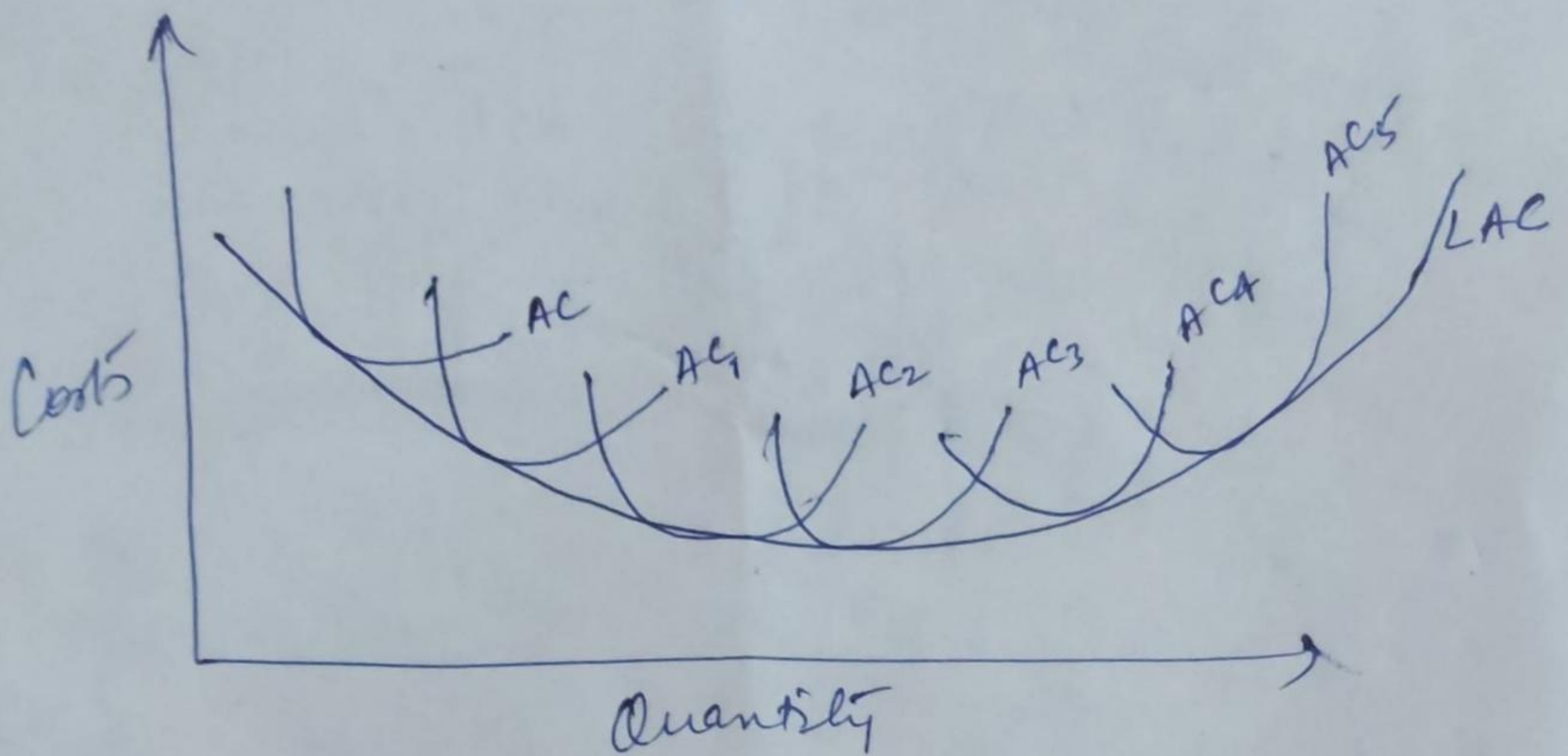
• Marginal Costs

$$MC = \frac{\Delta TC}{\Delta Q}$$

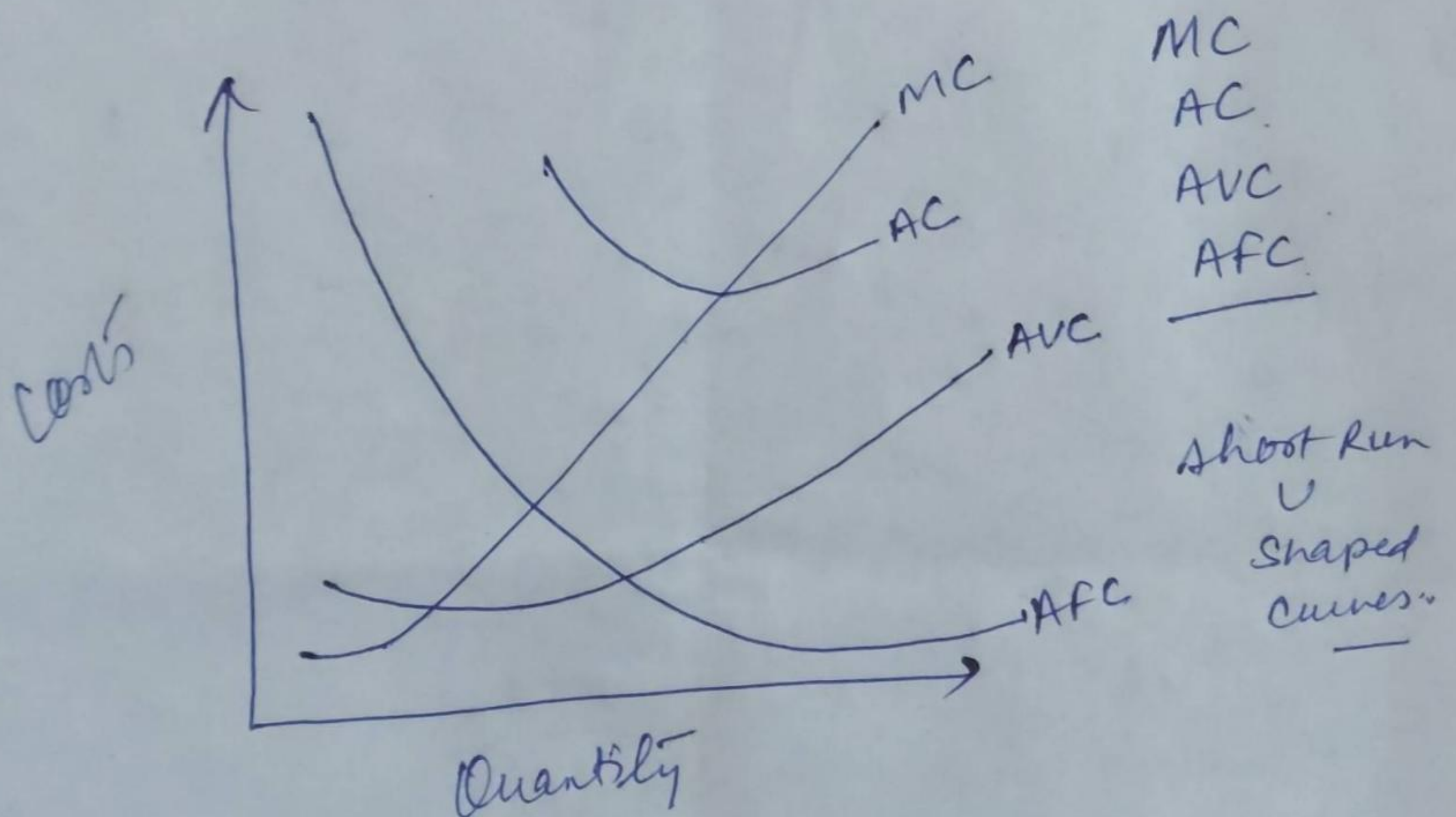
change in total cost
change in Quantity

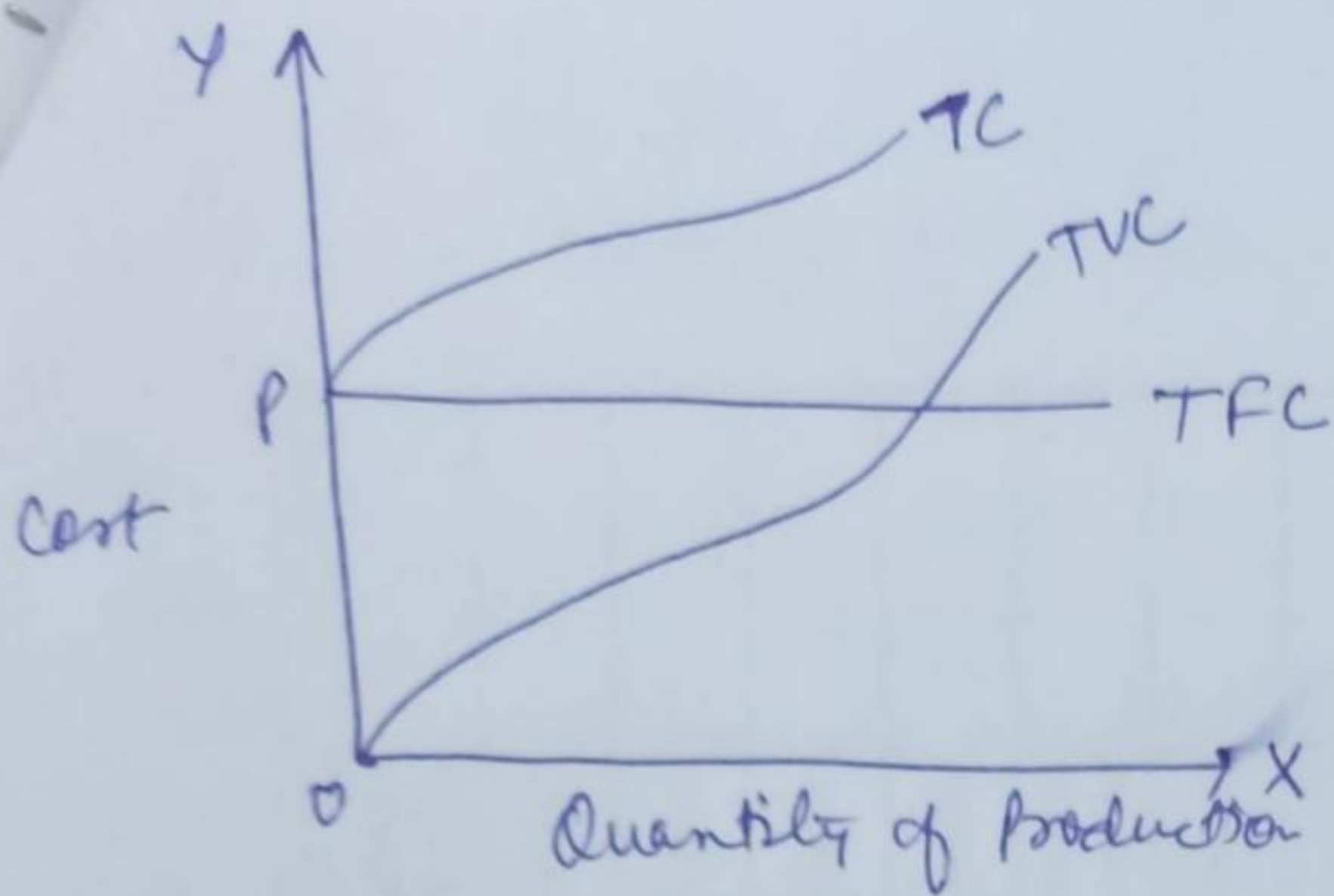
Modern Theories of Costs

Short Run AC and long Run AC

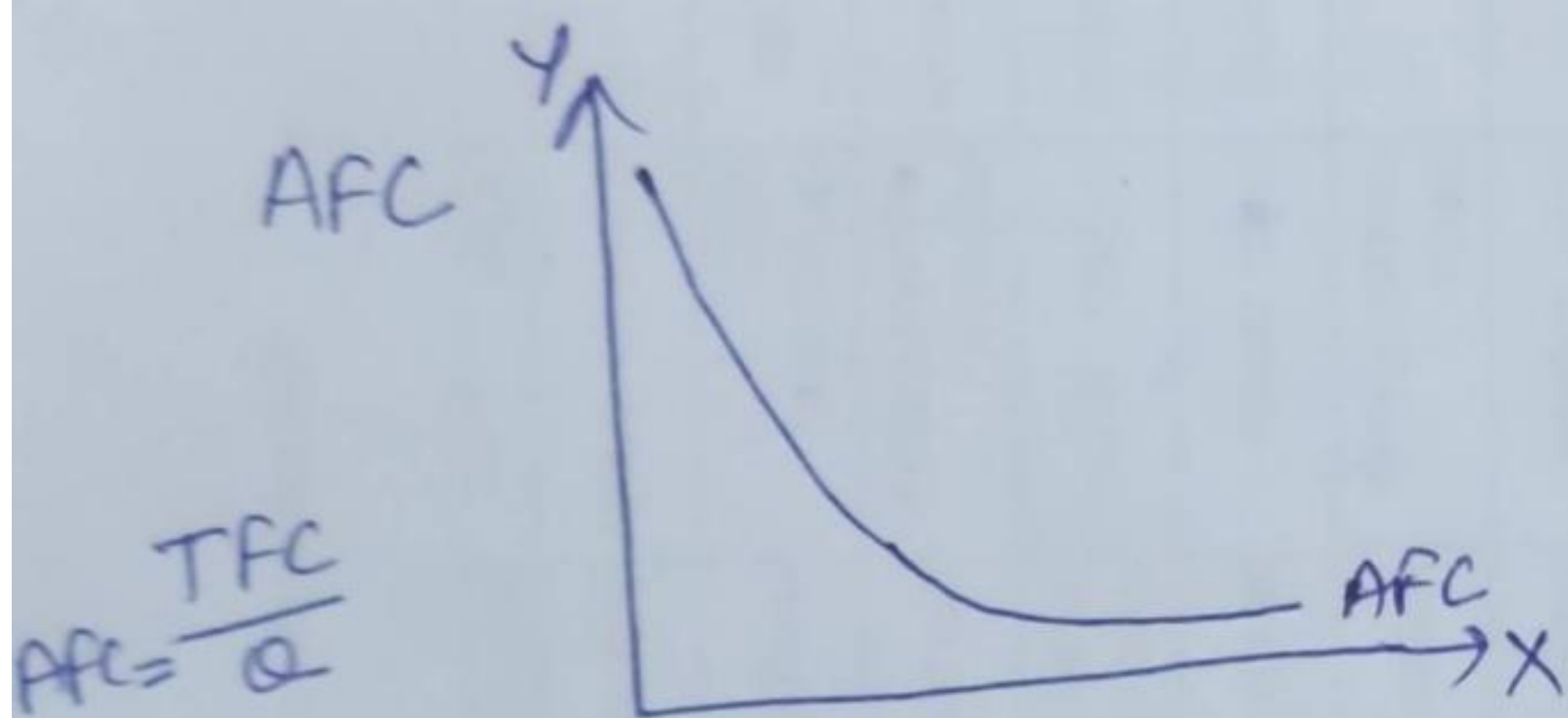


Long Run Cost Curves are L shaped
but
Short Run Cost Curves are U shaped.



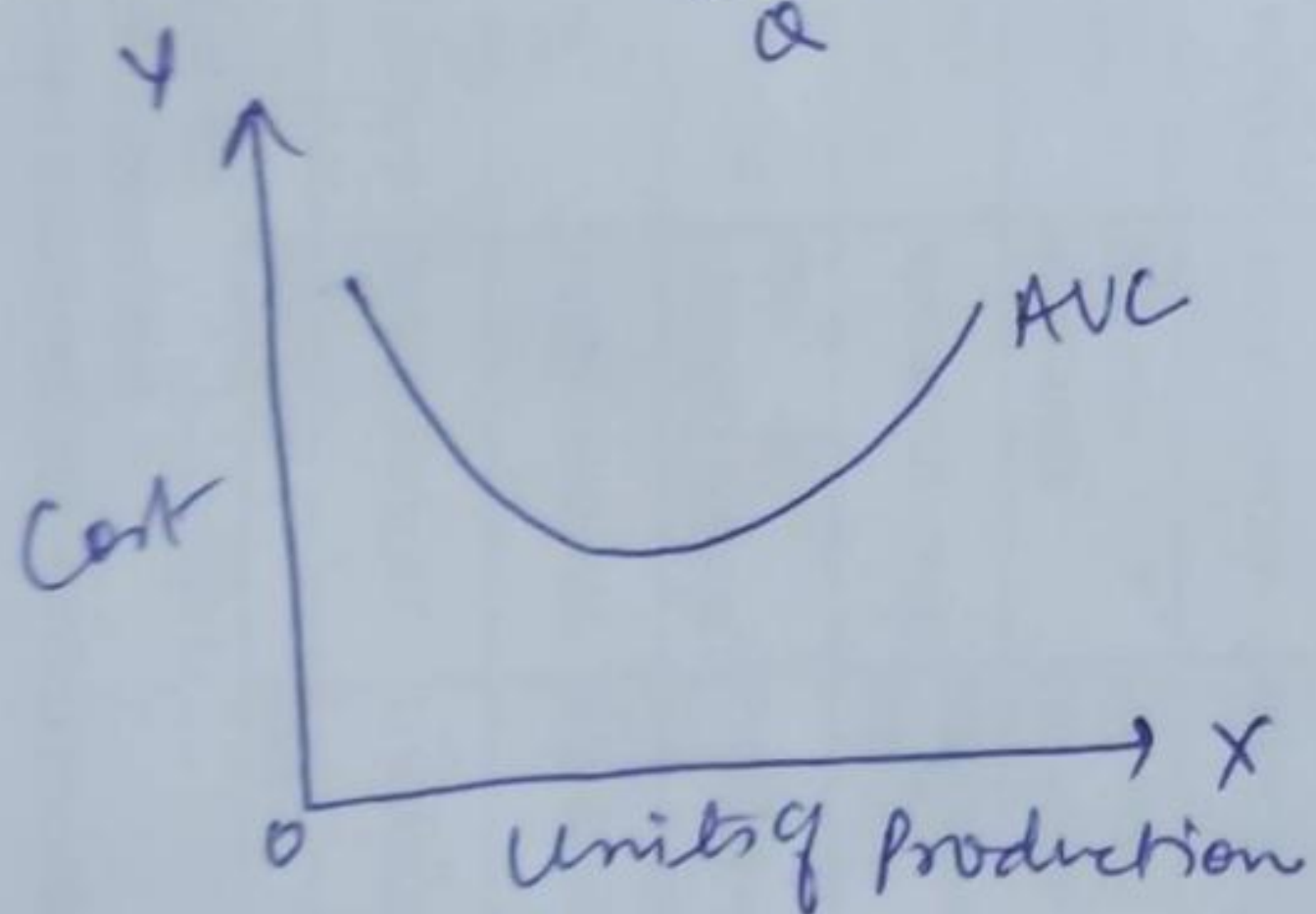


Short Run
Average
Costs



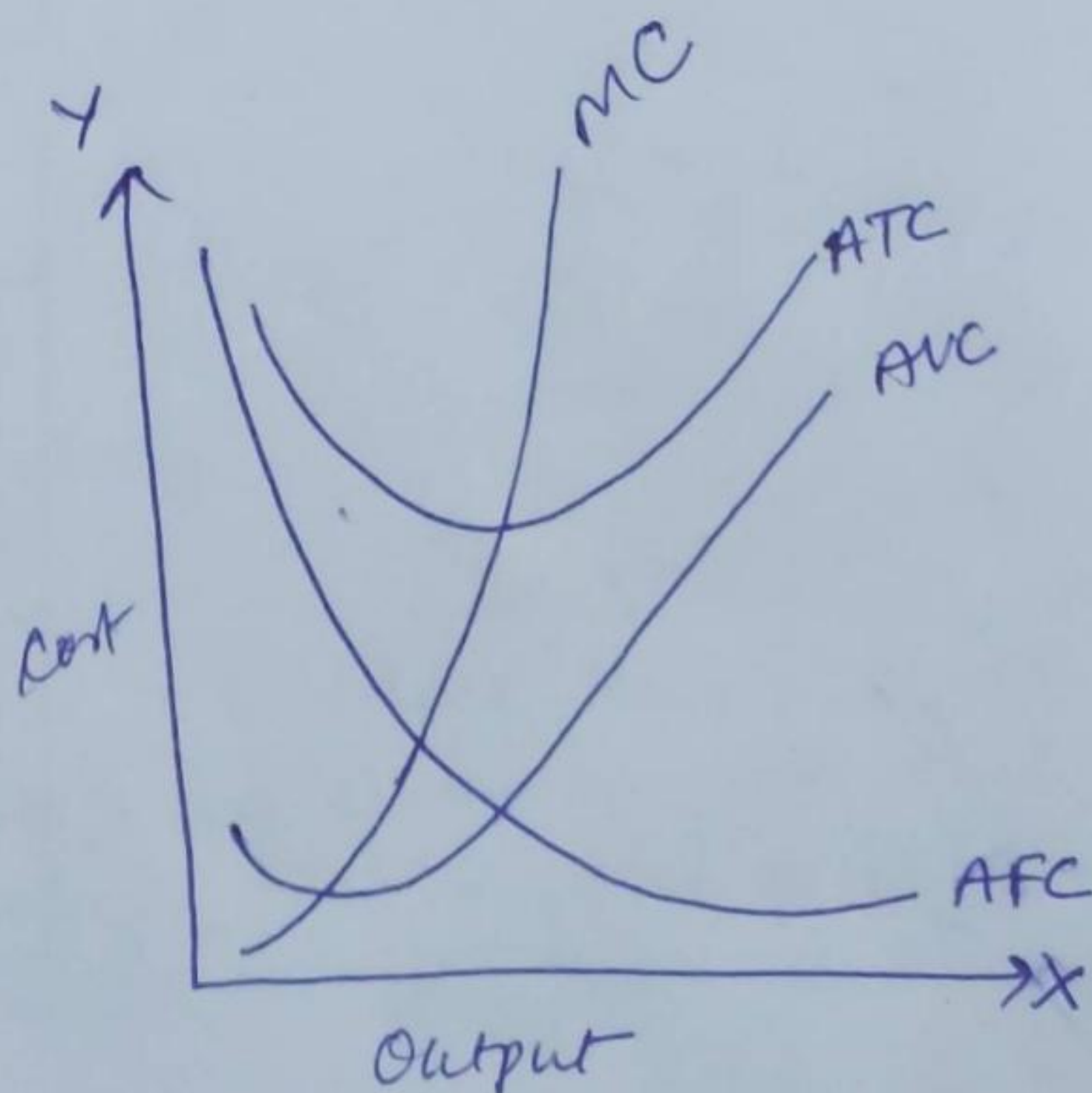
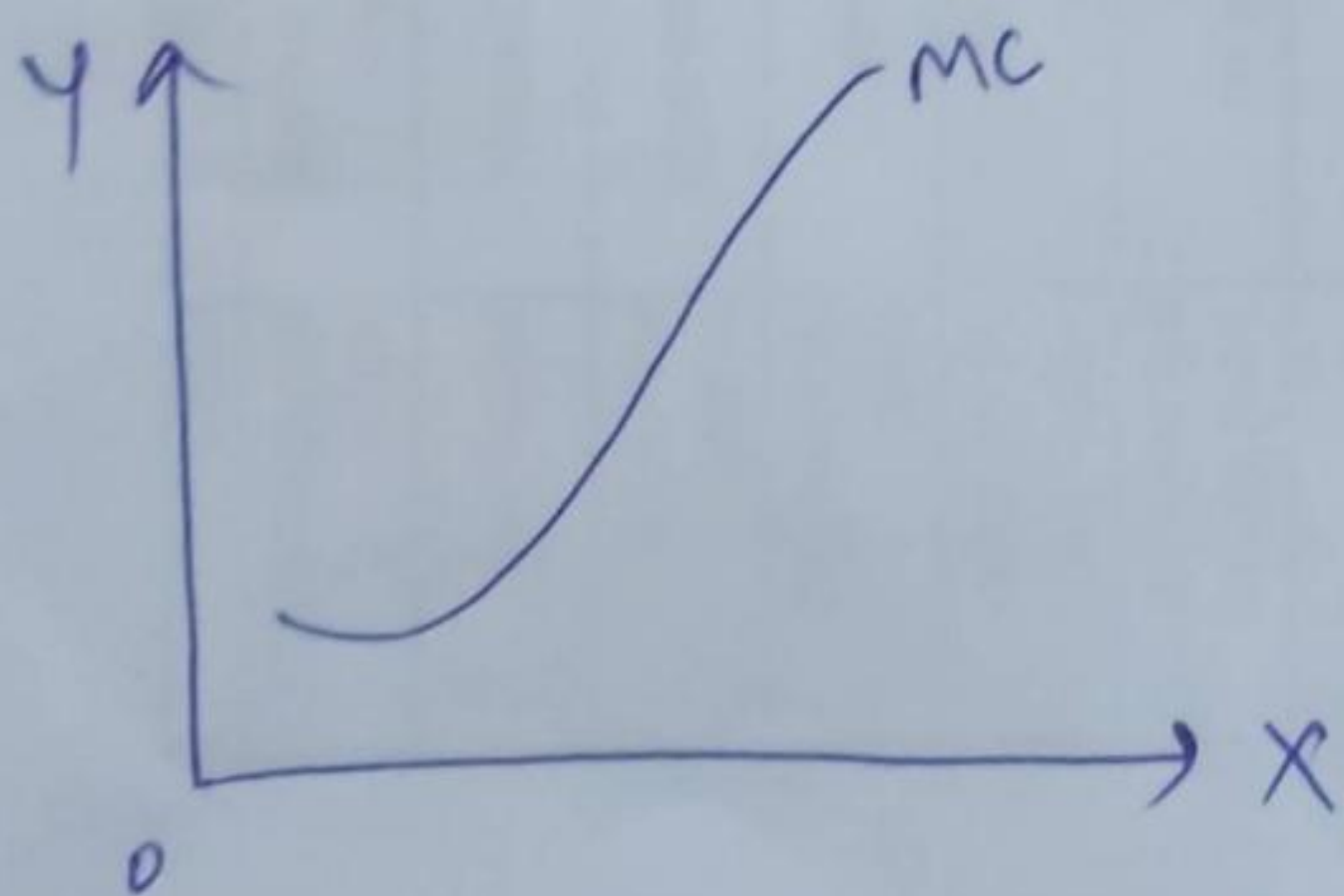
Units of Production	TFC	AFC
1	20	20
2	20	10
3	20	6.67
4	20	5
5	20	4

Average Variable Cost
 $\frac{TVC}{Q}$



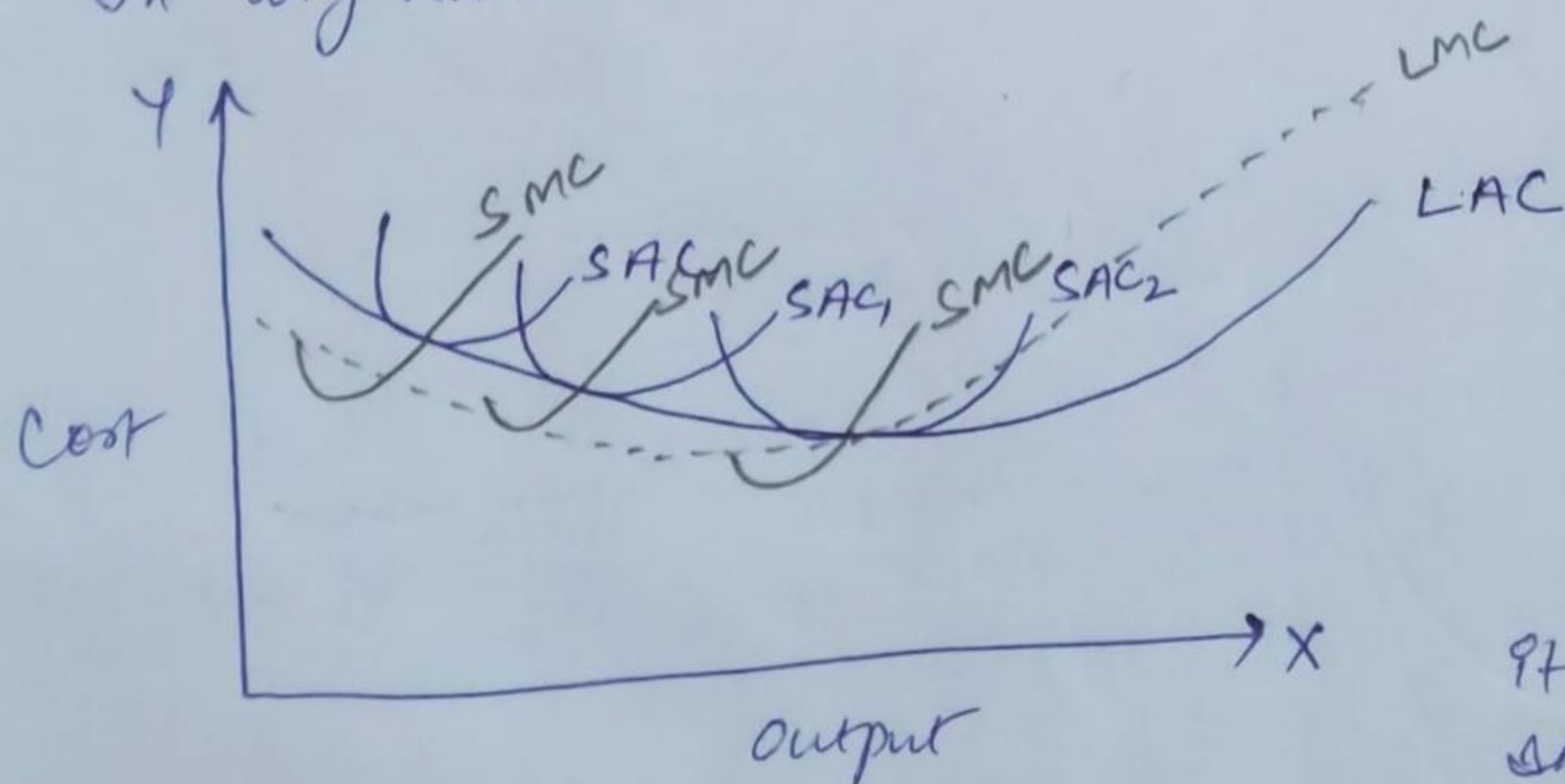
Units of Prod.	TVC	AVC
1	20	20
2	30	15
3	40	13.3
4	60	15
5	90	18

Marginal Cost $\Rightarrow \frac{\Delta TC}{\Delta Q}$



- AFC is av. fixed cost line which is declining \propto the successive increase of output.
- AVC, ATC and MC curves tend to decline \propto an increase in output upto an extent but afterward they start increasing upward.
These 3 curves are U-shaped.
- ATC tends to decline till MC is lesser than ATC but when MC becomes more than ATC then ATC starts increases.
- MC curve intersect ATC curve at its lowest point and $MC = ATC$
- In beginning both AVC and ATC curves tends to decline but as output increases beyond a limit there is sharp rise in AVC & ATC curves.
- MC intersects AVC curve at its minimum point.

In long Run



Long period curves is also U shaped but it is flatter in shape than short run curves

because fall & rise in long run average cost is slow. Minimum point of SAC curves will touch the minimum cost point of LAC curves.