

# PRODUCTION FUNCTION

# PRODUCTION

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- ✘ It is the creation of those goods and services that have exchange values.

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- ✘ It is an expression of the technological relation between physical inputs and output of a good.

## **Difference between Short Run and Long Run**

<b>Basis</b>	<b>Short run</b>	<b>Long run</b>
<b>Meaning</b>	Short run refers to a period in which output can be changed by changing only variable factors.	Long run refers to a period in which output can be changed by changing all factors of production.
<b>Classification</b>	Factors are classified as variable and fixed factor in the short run.	All factors are variable in the long run.
<b>Price determination</b>	In the short run, demand is more active in price determination as supply cannot be increased immediately with increase in demand.	In the long run, both demand and supply play equal role in price determination as both can be increased.

# DIFFERENCE BETWEEN VARIABLE FACTORS AND FIXED FACTORS

<b>Basis</b>	<b>Variable factors</b>	<b>Fixed factors</b>
Meaning	Variable factors refer to those factors, which can be changed in the short run.	Fixed factors refer to those factors which cannot be changed in the short run.
Relation with output	They vary directly with output.	They do not vary directly with output.
Example	Raw material, casual labour, power, fuel, etc.	Building, plant and machinery, permanent staff, etc.

# CONCEPT OF PRODUCT

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- × PRODUCT OR OUTPUT REFERS TO THE VOLUME OF GOODS PRODUCED BY A FIRM OR AN INDUSTRY DURING A SPECIFIED PERIOD OF TIME

# CONCEPT OF PRODUCT

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## ✘ TOTAL PRODUCT (TP):

TOTAL PRODUCT REFERS TO TOTAL QUANTITY OF GOODS PRODUCED BY A FIRM DURING A GIVEN PERIOD OF TIME WITH GIVEN NUMBER OF INPUTS

# CONCEPT OF PRODUCT

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- ✘ AVERAGE PRODUCT (AP) :  
AVERAGE PRODUCT REFERS TO  
OUTPUT PER UNIT OF VARIABLE  
INPUT



# CONCEPT OF PRODUCT

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## ✘ MARGINAL PRODUCT (MP):

MARGINAL PRODUCT REFERS TO ADDITION TO TOTAL PRODUCT, WHEN ONE MORE UNIT OF VARIABLE FACTOR IS EMPLOYED

# LAW OF VARIABLE PROPORTIONS

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## ✘ STATEMENT OF LAW:

LAW OF VARIABLE PROPORTIONS (LVP) STATES THAT AS WE INCREASE QUANTITY OF ONLY ONE INPUT KEEPING OTHER INPUTS FIXED ,TOTAL PRODUCT(TP) INITIALLY INCREASES AT AN INCREASING RATE, THEN AT A DECREASING RATE AND FINALLY AT A NEGATIVE RATE

# ASSUMPTIONS OF LAW OF VARIABLE PROPORTIONS

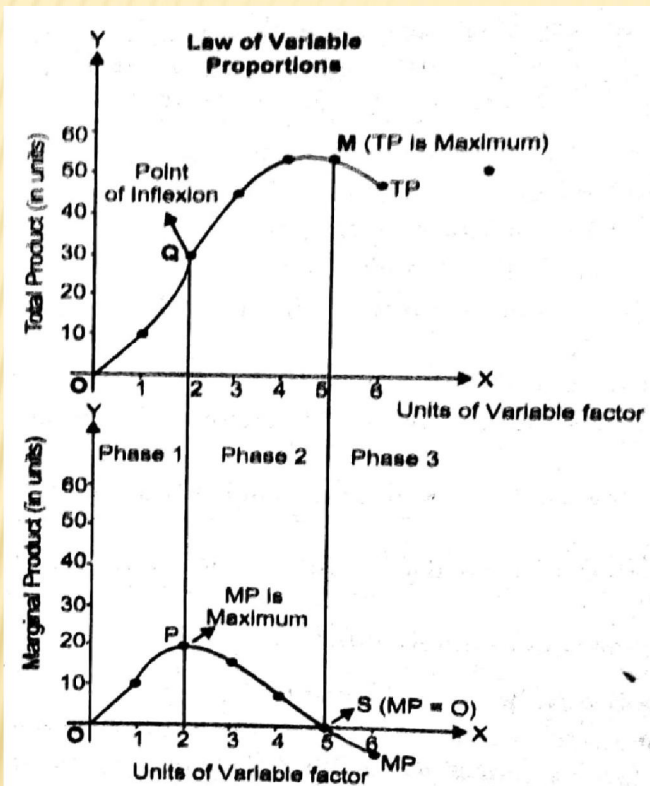
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- ✘ IT OPERATES IN SHORT RUN
- ✘ THE LAW APPLIES TO ALL FIXED FACTORS INCLUDING LAND
- ✘ THIS LAW APPLIES TO FIELD OF PRODUCTION ONLY
- ✘ THE STATE OF TECHNOLOGY IS ASSUMED TO BE CONSTANT
- ✘ ALL VARIABLE FACTORS ARE EQUALLY EFFICIENT

# LAW OF VARIABLE PROPORTIONS

**Table 5.1: Law of Variable Proportions**

<b>Fixed factor (Land in acres)</b>	<b>Variable factor (labour)</b>	<b>TP (units)</b>	<b>MP (units)</b>	<b>Phase</b>
1	1	10	10	1 <sup>st</sup> (Increasing returns to a factor)
1	2	30	20	
1	3	45	15	2 <sup>nd</sup> (Diminishing returns to a factor)
1	4	52	7	
1	5	52	0	
1	6	48	- 4	3 <sup>rd</sup> (Negative returns to a factor)



- **Phase 1 (Between O to Q)**  
TP increases at an increasing rate and MP also increases.
- **Phase 2 (Between Q to M)**  
TP increases at decreasing rate and MP falls. This phase ends when MP becomes zero and TP reaches its maximum point.
- **Phase 3 (Beyond point M)**  
TP starts decreasing and MP not only falls, but also becomes negative.
- **Point of Inflexion (Point Q)**  
Point 'Q' is known as point of inflexion as curvature of TP curve changes at this point. Till point Q, TP is concave shaped and beyond point Q, TP becomes convex shaped.