

Law of Demand & Elasticity of Demand

General Economics

Demand

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graph TD; Demand[Demand] --> Willing[Willing to Purchase at Various Prices during Period of Time]; Demand --> Able[Able to Purchase at Various Prices during Period of Time];
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**Willing to
Purchase at
Various Prices
during Period of
Time**

**Able to Purchase
at Various Prices
during Period of
Time**

Definitions of Demand

- Demand refers to the Quantities of Commodity that the Consumers are Able to Buy at each possible Price during a given Period of Time, other things being equal.

By : Ferguson

- Demand is the Ability and Willingness to buy Specific Quantity of a Good at Alternative Prices in a given Time Period, Ceteris Paribus.

Determinants of Demand

- **Price of the Commodity**
- **Price of Related Commodities**
- **Level of Income of the Household**
- **Taste & Preferences of Consumers**
- **Other Factors**

Determinants of Demand

- Price of the Commodity

Ceteris paribus i.e. Other Things
Being Equal,

$$D \propto \frac{1}{P}$$

This Happens Because of Income &
Substitution Effect.

Determinants of Demand

- Price of Related Commodities

Complementary Goods e.g. Pen & Ink

Price of one Good



Demand of Other Good



Substituting Goods e.g. Tea & Coffee

Price of one Good



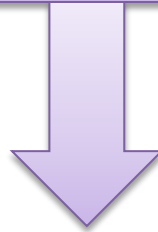
Demand of Other Good



Determinants of Demand

- Level of Income of the Household

Average Money Income
Quantity Demanded of a Good



Exception: Inferior Goods

Average Money Income
Quantity Demanded of a Good



Determinants of Demand

- Taste & Preferences of Consumers
- Other Factors
 - Size of the Population
 - Composition of Population

Law of Demand

- Law of demand states that People will Buy more at Lower Prices and Buy less at Higher Prices, Ceteris paribus, or other things Remaining the Same.

By : Samuelson

- The Law of Demand states that Quantity Demanded Increases with a Fall in Price and Diminishes when Price Increases, other things being equal.

By : Marshall

Assumption to Law of Demand

- Law of demand holds Good when “Other Things Remain the Same” meaning thereby, the factors affecting demand ,other then price, are assumed to be constant.
- **Demand Function:** $D_x = f(P_x, P_r, Y, T, E)$
where, D_x = Demand for Commodity
 P_x = Price of Commodity X
 P_r = Price of Other Goods
 Y = Income of the Consumer
 T = Tastes
 E = Expectation of the Consumer

Explanation

- According to Law of Demand, Ceteris Paribus

$$\text{Quantity Demanded} \propto \frac{1}{\text{Price}}$$

However, this Relation is not Proportional, meaning thereby that it is not necessary that when Price Falls by $\frac{1}{2}$, Demand for Goods will be Doubled.

This simply indicates the Direction of Change in Demand as a result of Change in Price.

Demand Schedule

- Demand Schedule is a Series of Quantities which Consumer would like to Buy per unit of Time at Different Prices.
- Two Aspects of Demand Schedule
 - Individual Demand Schedule
 - Market Demand Schedule

Individual Demand Schedule

- It is defined as a Table which shows Quantities of a Given Commodity which an Individual Consumer will buy at all Possible Prices at a given Time.

Price per unit (in Rs.)	Quantity Demanded (Units)
1	4
2	3
3	2
4	1

Market Demand Schedule

- It is defined as the Quantities of a Given Commodity which all Consumers will buy at all Possible Prices at a given Moment of Time. In Market there are many Consumers of a Single Commodity. The Schedule is based on the Assumption that there are in all, 2 Consumers 'A' & 'B' of Commodity 'X'. By aggregating their Individual Demand, the Market Demand Schedule is constructed.

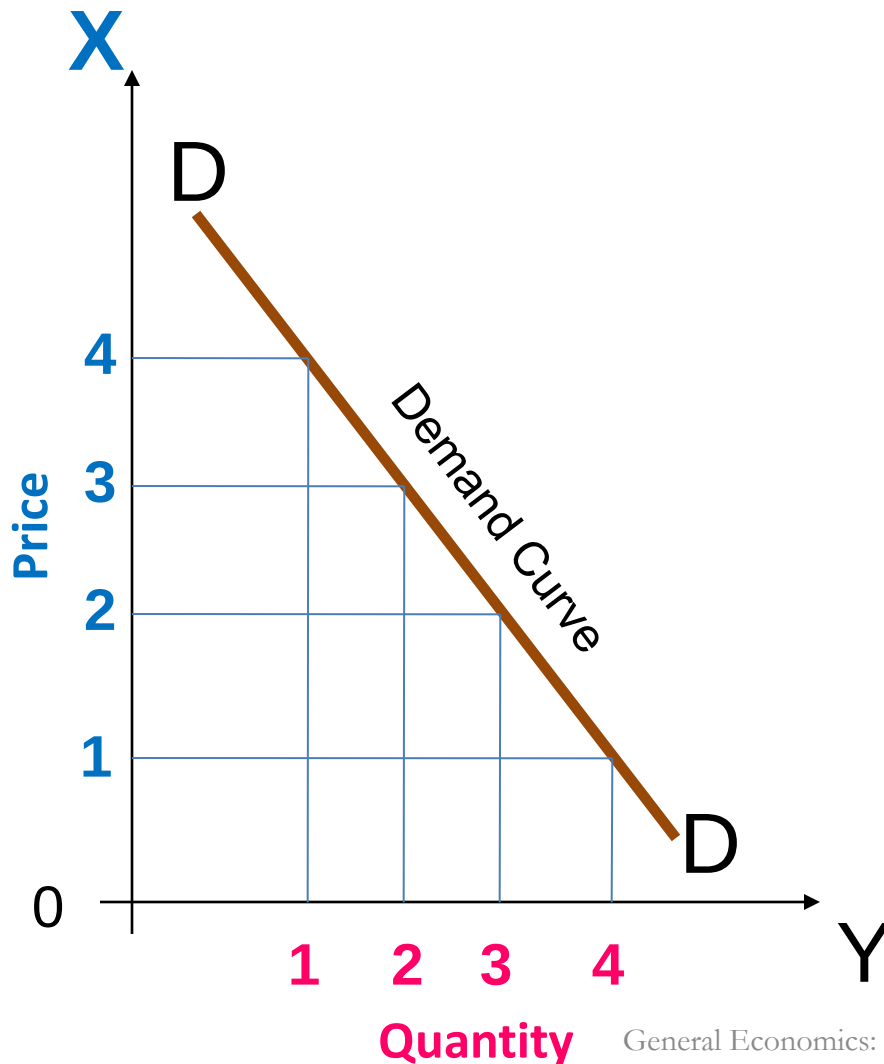
Price of Commodity 'X' (in Rs.)	Demand of A	Demand of B	Market Demand (Units)
1	4	5	4+5=9
2	3	4	3+4=7
3	2	3	2+3=5
4	1	2	1+2=3

It indicates that when price of 'X' is Rs 1.00 per unit, Demand of 'A' is for 4 units and that of 'B' is for 5 units. Thus the Market Demand is 9 units. As the Price Increases, Demand Decreases.

Demand Curve

- A Demand Curve is a Locus of Points showing various Alternative Price-Quantity Combinations.
- It shows the Inverse Relationship between Price & Quantity Demanded.
- It Slopes Downwards to the Right.

Individual Demand Curve



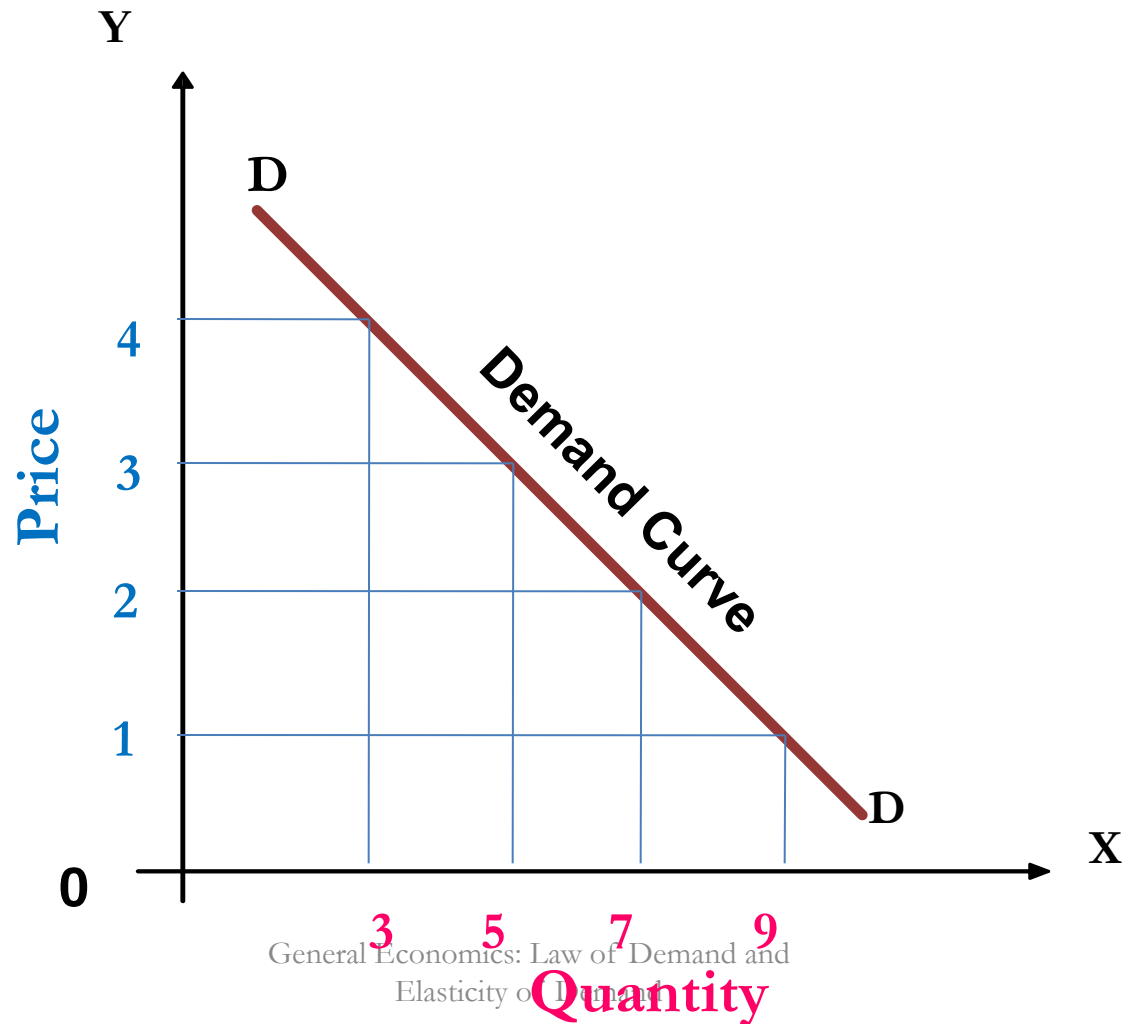
X Axis – Price (Rs.)

Y Axis – Quantity

DD – Demand Curve

The Demand Curve Slopes Downwards from Left to Right, meaning thereby that when Price is High Demand is Low and vice versa.

Market Demand Curve



Why does Demand Curve Slope Downward?

- Income Effect : It is the Effect that a Change in a Person's Real Income caused by Change in the Price of a Commodity has on the Quantity of that Commodity. In other words, the Increase in Demand on Account of Increase in Real Income is known as Income Effect.
- Substitution Effect : It is the Effect that a Change in Relative Prices of Substitute Goods has on the Quantity Demanded. Substitutes are Goods that can be used in place of each other.

Why does Demand Curve Slope Downward?

- Different Uses: Demand for Commodities with Alternative Uses tends to Extend Consequent upon the fall in their prices.
- Size of Consumer Group: When the Price of a Commodity falls, then many Consumers, who are unable to buy that Commodity at its Previous Price, Come Forward to buy it.

Exceptions to Law of Demand

- Article of Distinction or Veblen Goods: Goods like Jewellery, Diamonds & Gems are considered as Articles of Distinction. These Goods command More Demand when their Prices are High.
- Ignorance: Many a time, Consumers out of sheer Ignorance or Poor Judgment consider a Commodity to be of Low Quality if its Price is Low and of High Quality if its Price is High.

Exceptions to Law of Demand

- **Giffen Goods** : Giffen Goods are those Inferior Goods whose Demand falls even when their Prices Falls. For example, 'Bajra'. Only those Inferior Goods are called Giffen Goods where Law of Demand Fails.
- **Expectation of Rise or Fall in Price in Future**: If Prices are likely to Rise More in the Future then even at the Existing Higher Price people may Demand more Units of the Commodity in the Present and vice versa.

Expansion & Contraction in Demand

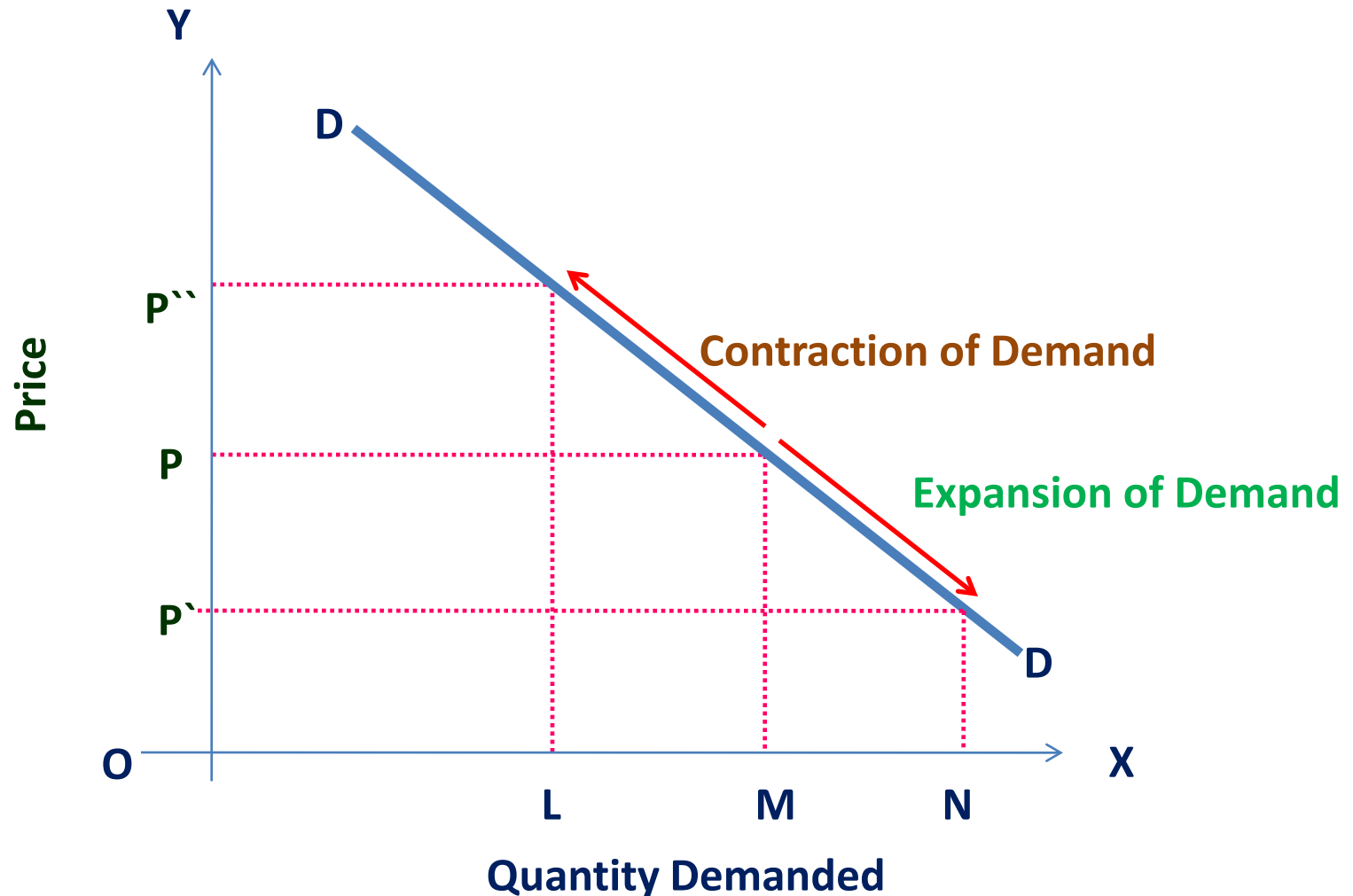
Expansion

- Price ↓, QD ↑
- Downward Movement Along the Demand Curve

Contraction

- Price ↑, QD ↓
- Upward Movement Along the Demand Curve

Expansion & Contraction in Demand



Increase & Decrease in Demand

Increase

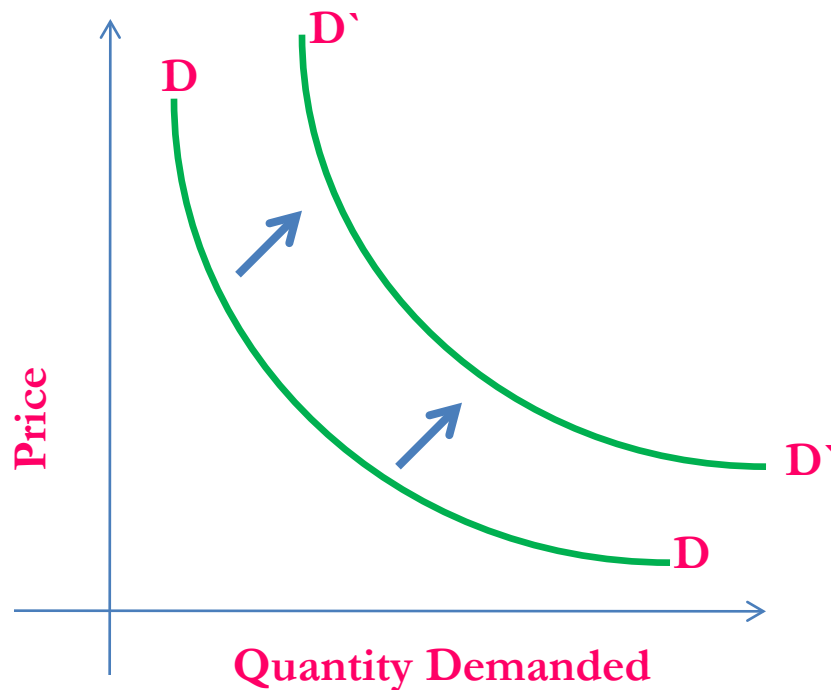
- Price Same, QD $\uparrow$ due to Change in Other Factors
- Rightward Shift

Decrease

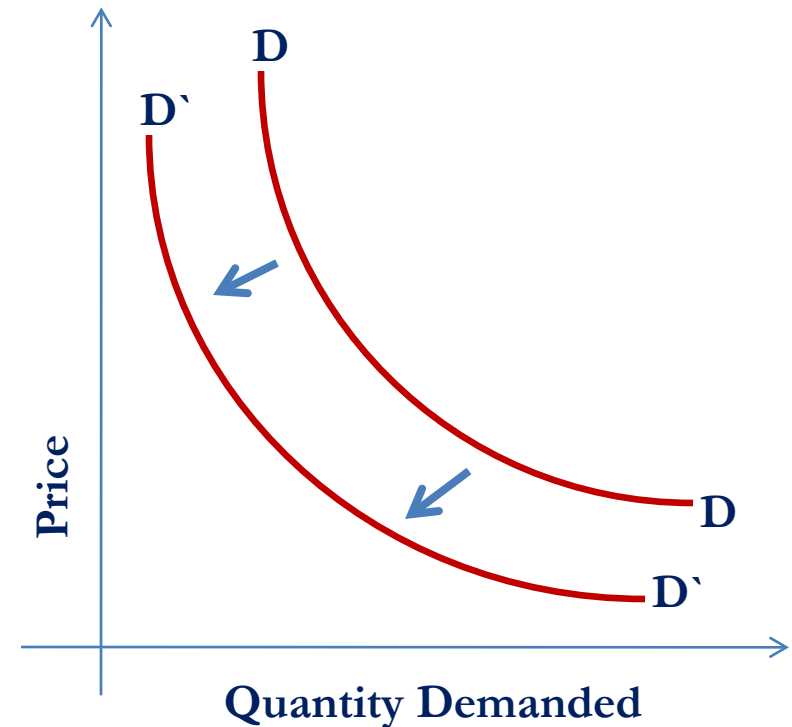
- Price Same, QD $\downarrow$ due to Change in Other Factors
- Leftward Shift

Increase & Decrease in Demand

Increase in Demand



Decrease in Demand



Distinction between Extension & Increase in Demand

- Extension in Demand means Rise in Demand in Response to fall in the Price of a Commodity, Other things being equal.
- It is expressed by the Movement from a Higher Point to a Lower Point along the same Demand Curve.
- Increase in Demand refers to the Rise in Demand in Response to the Change in the Determinants of Demand other than Price.
- It is expressed by the Upward Shift of the Entire Demand Curve.

Distinction between Contraction & Decrease in Demand

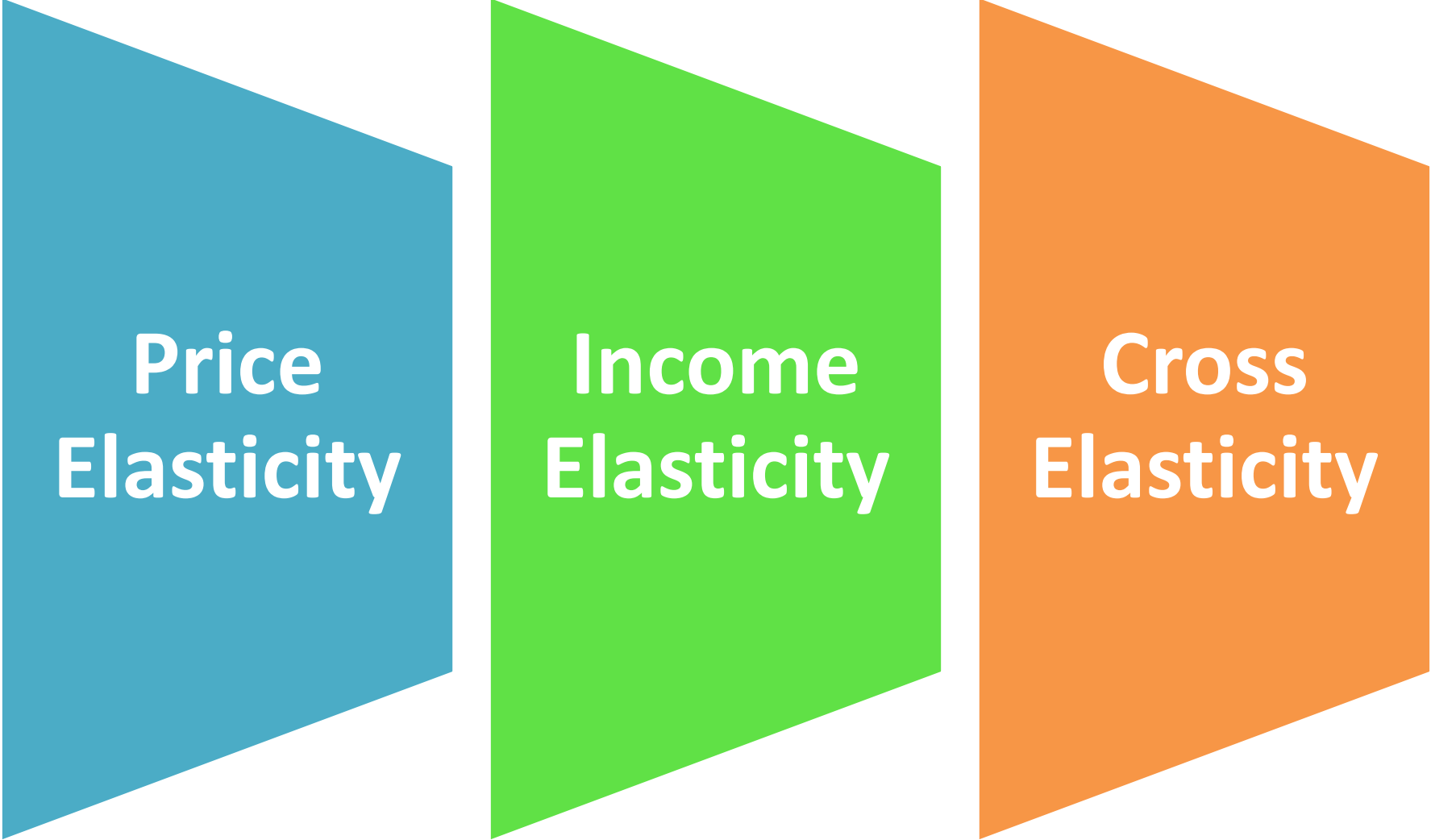
- **Contraction in Demand** means Fall in Demand in Response to a Rise in the Price of a Commodity, Other things being Equal.
- It is expressed by the Movement from a Lower Point to a Higher Point on the Same Demand Curve.
- **Decrease in Demand** means Fall in Demand in Response to Change in Determinants of Demand, Other than the Price.
- It is expressed by a Downward Shift of the Entire Demand Curve.

Elasticity of Demand

- It answers the Question “BY HOW MUCH?”
- Elasticity of Demand is defined as the Responsiveness of the Quantity Demanded of a Good to Change on one of the Variables on which Demand Depends.

$$E = \frac{\% \text{ Change in Q.D.}}{\% \text{ Change in one of the Variables on which Demand depends}}$$

Types of Elasticity of Demand



**Price
Elasticity**

**Income
Elasticity**

**Cross
Elasticity**

Price Elasticity of Demand

It is Measured as a Percentage Change in Quantity Demanded Divided by the Percentage Change in Price, Other things Remaining Same.

$$E_p = \frac{\% \text{ Change in Q.D.}}{\% \text{ Change in Price}}$$

$$E_p = \frac{\text{Change in Quantity}}{\text{Change in Price}} \times \frac{\text{Original Price}}{\text{Original Quantity}}$$

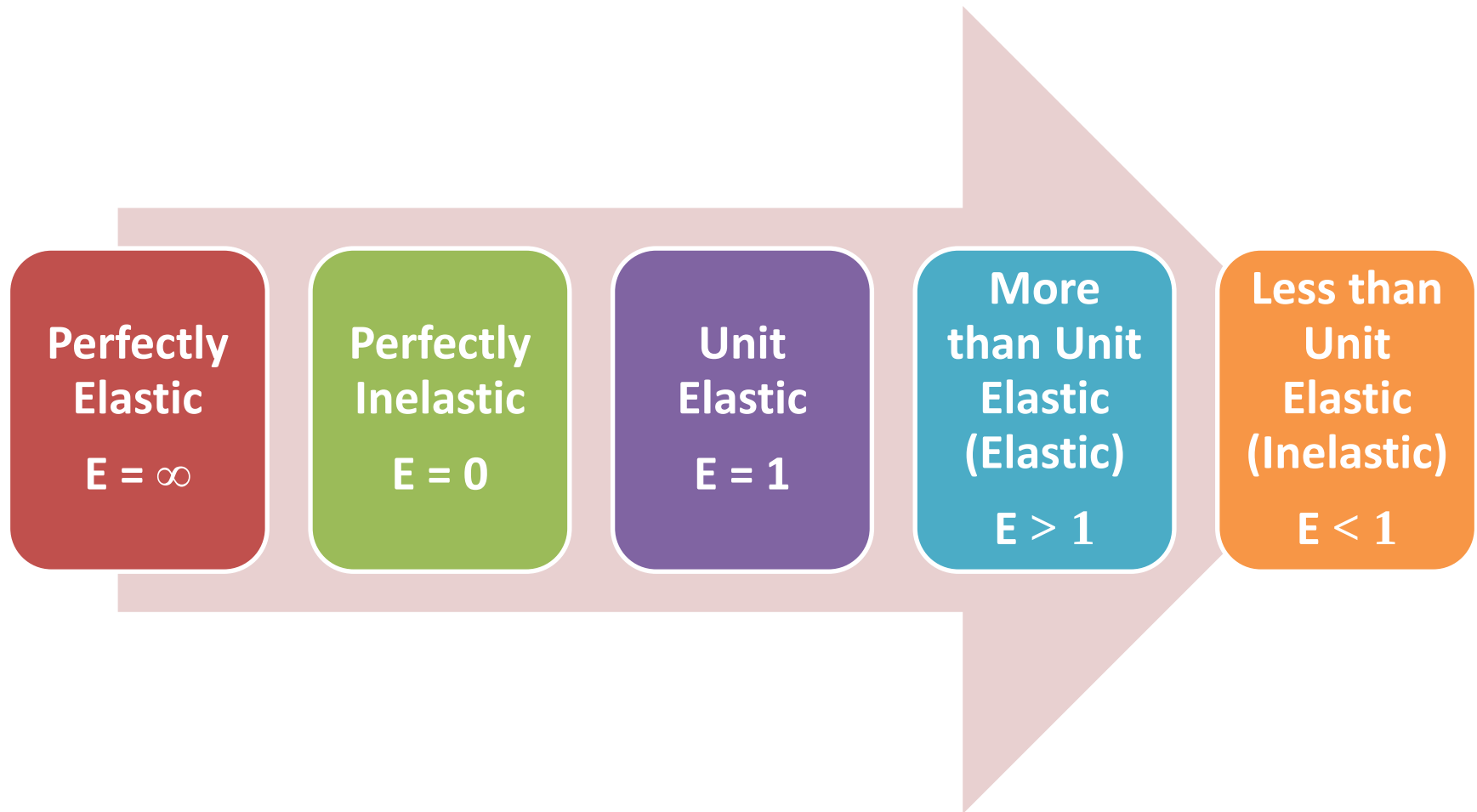
Price Elasticity of Demand

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

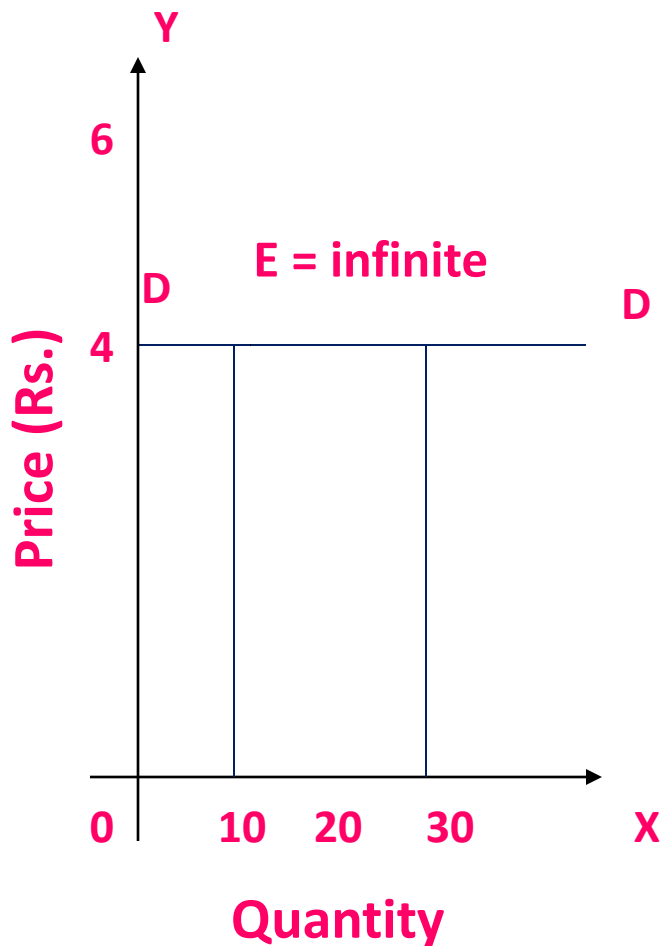
Where,	E_p	Price Elasticity
	Δ	Very Small Change
	P	Price
	Q	Quantity Demanded

Note: E_p is (-)ve due to Inverse Relationship Between Price & Quantity Demanded.

Degrees of Price Elasticity of Demand

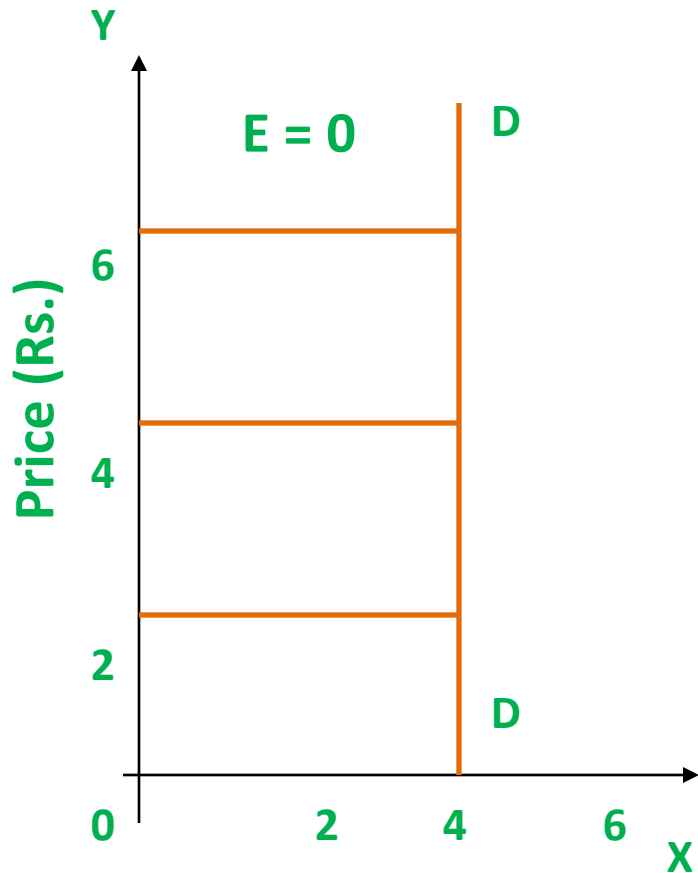


Perfectly Elastic Demand



- A Perfectly Elastic Demand is one in which a Little Change in Price will Cause an Infinite Change in Demand.
- A very little Rise in Price causes the Demand to Fall to Zero and a very little Fall in Price causes Demand to Extend to Infinity.
- Under Perfect Competition, Demand Curve of a Firm is Perfectly Elastic.

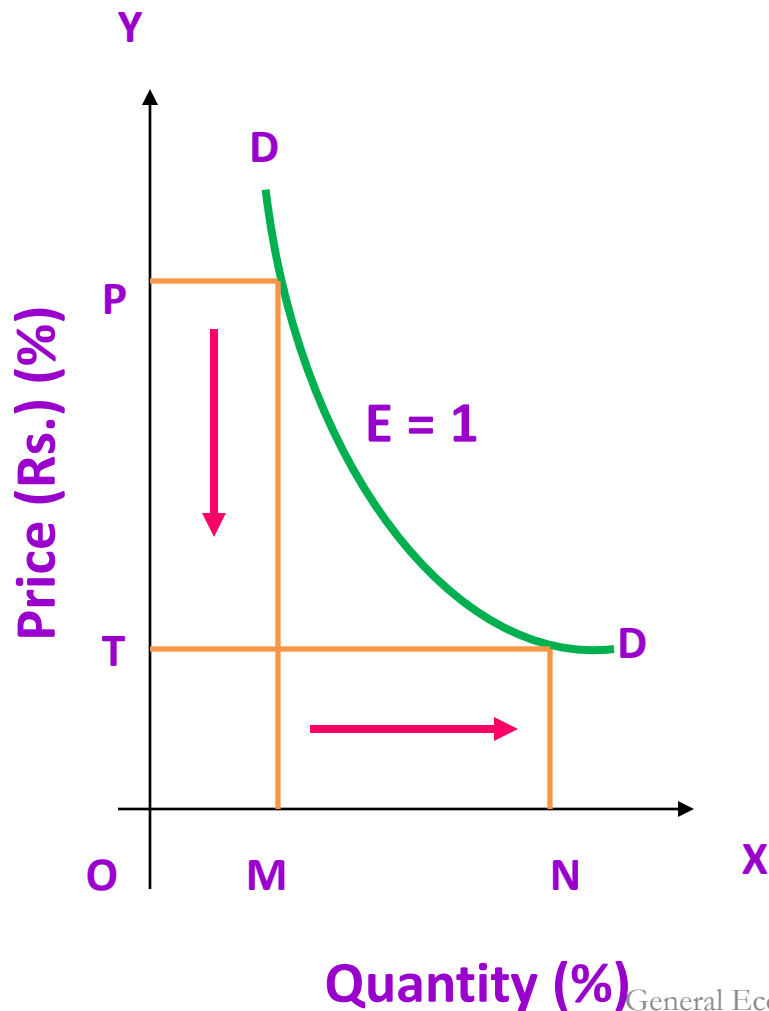
Perfectly Inelastic Demand



Quantity

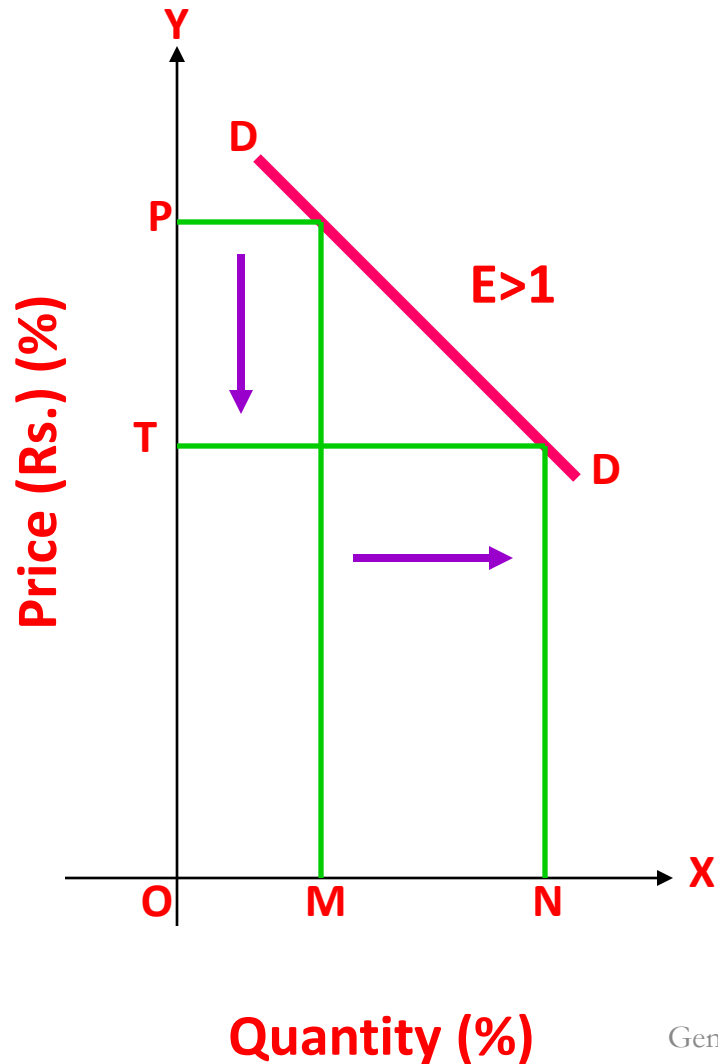
- **Perfectly Inelastic Demand is one in which a Change in Price Produces No Change in the Quantity Demanded.**
- **In this case, Elasticity of Demand is Zero.**

Unitary Elastic Demand



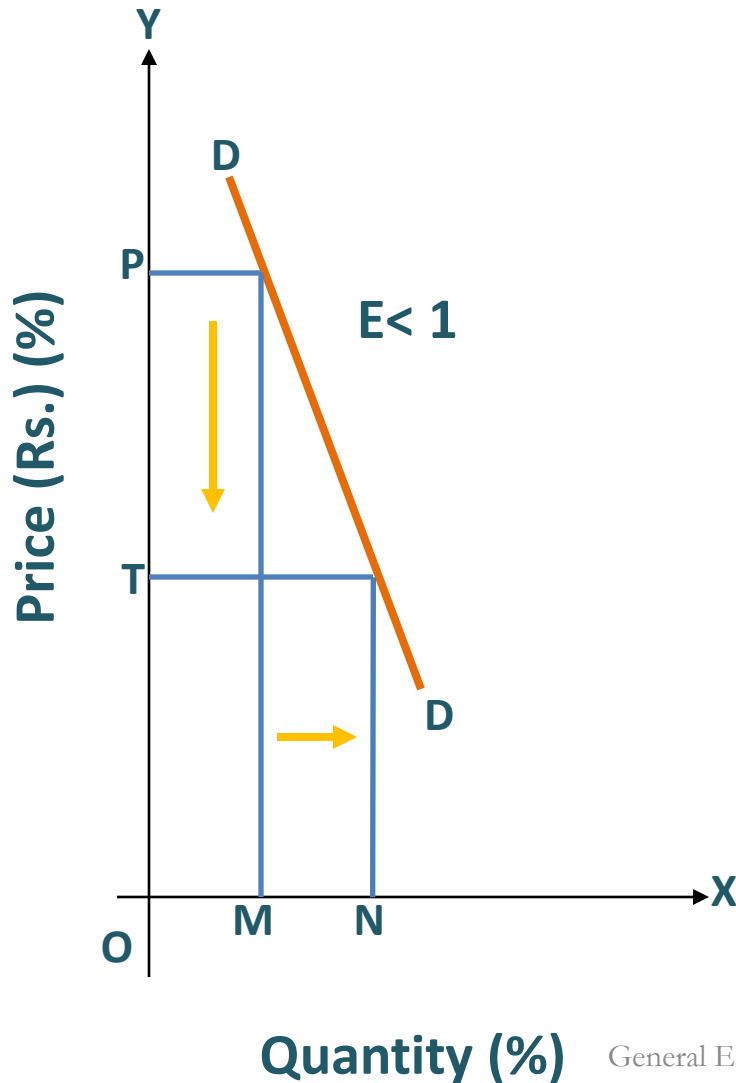
- **Unitary Elastic Demand** is one in which a % Change in Price Produces an Equal % Change in Demand.
- This type of Demand Curve is called **Rectangular Hyperbola**.

Greater than Unitary Elastic Demand



- Greater than Unitary Elastic Demand is one in which a Given %Change in Price Produces Relatively more %Change in Demand.
- In this case Elasticity of Demand is Greater than Unitary.

Less than Unitary Elastic Demand



- Less than Unitary Elastic Demand is one in which a given % Change in Price Produces Relatively Less % Change in Demand
- In this case, Elasticity of Demand is Less than Unitary.

Point Elasticity of Demand

- Refers to Measuring the Elasticity at a Particular Point on Demand Curve.
- Makes Use of Derivative Changes Rather than Finite Changes in Price & Quantity.
- Defined As:

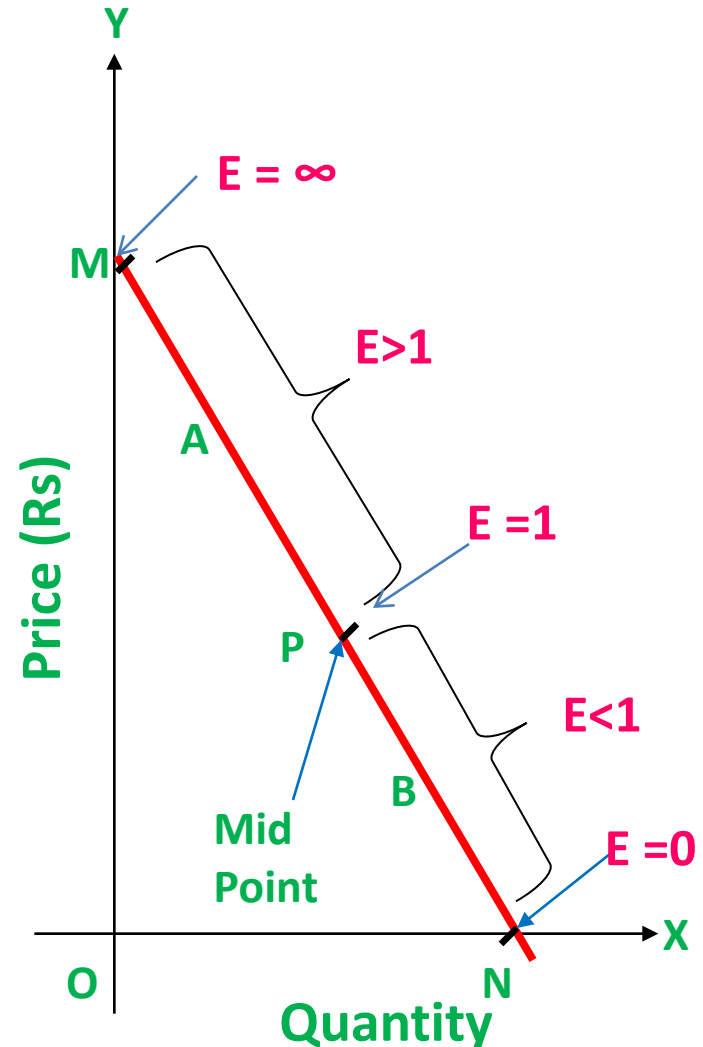
$$\frac{dq}{dp} \times \frac{p}{q}$$

Where, $\frac{dq}{dp}$ is the derivative of Quantity w.r.t. Price at a point on Demand Curve.

Point Elasticity of Demand

$$\text{Point Elasticity} = \frac{\text{Upper Segment}}{\text{Lower Segment}}$$
$$= \frac{PM}{PN}$$

- As we Move from N to M, Elasticity Goes on Increasing. At Mid Point, $E_p = 1$, at N $E_p = 0$ & at M $E_p = \infty$



Arc Elasticity of Demand

- When Elasticity is to be found between 2 Points, we use Arc Elasticity.

$$\text{Elasticity} = \frac{q_1 - q_2}{q_1 + q_2} \times \frac{p_1 + p_2}{p_1 - p_2}$$

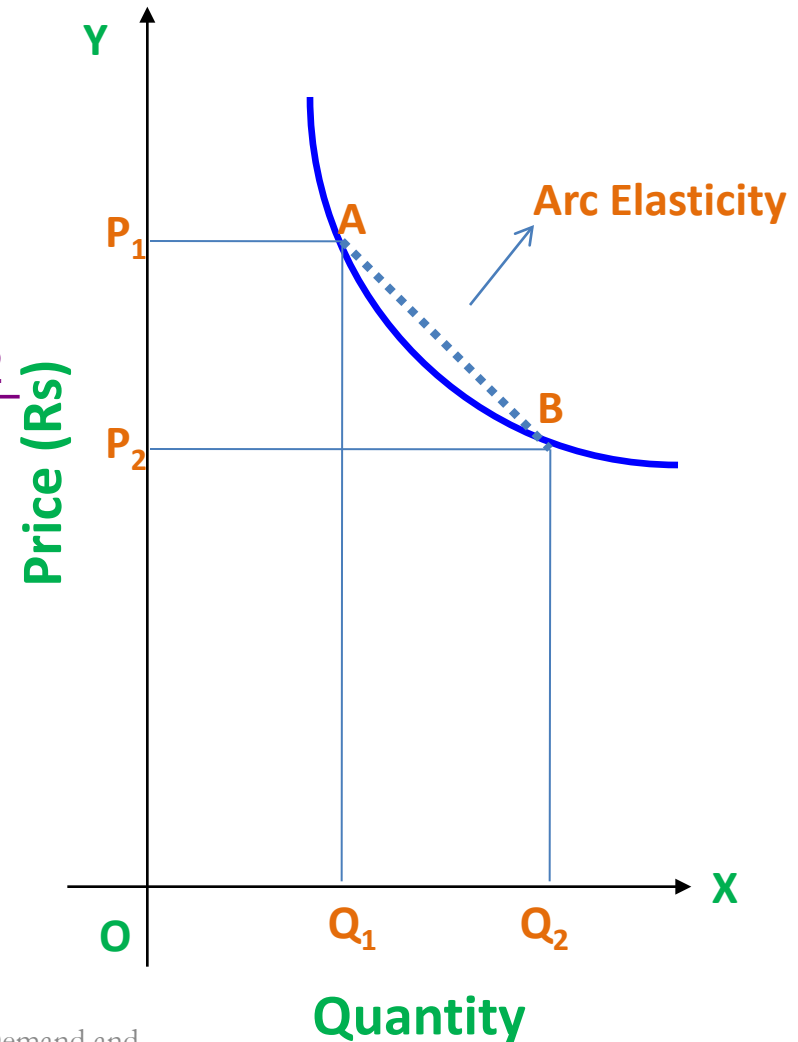
Where,

p_1 = Original Price

q_1 = Original Quantity

p_2 = New Price

q_2 = New Quantity



Arc Elasticity of Demand

For Example, Find Elasticity of Radios Between:

$$p_1 = \text{Rs. } 500$$

$$q_1 = 100$$

$$p_2 = \text{Rs. } 400$$

$$q_2 = 150$$

$$\text{Elasticity} = \frac{q_1 - q_2}{q_1 + q_2} \times \frac{p_1 + p_2}{p_1 - p_2}$$

$$E_p = \frac{50}{250} \times \frac{900}{100}$$

$$E_p = 1.8$$

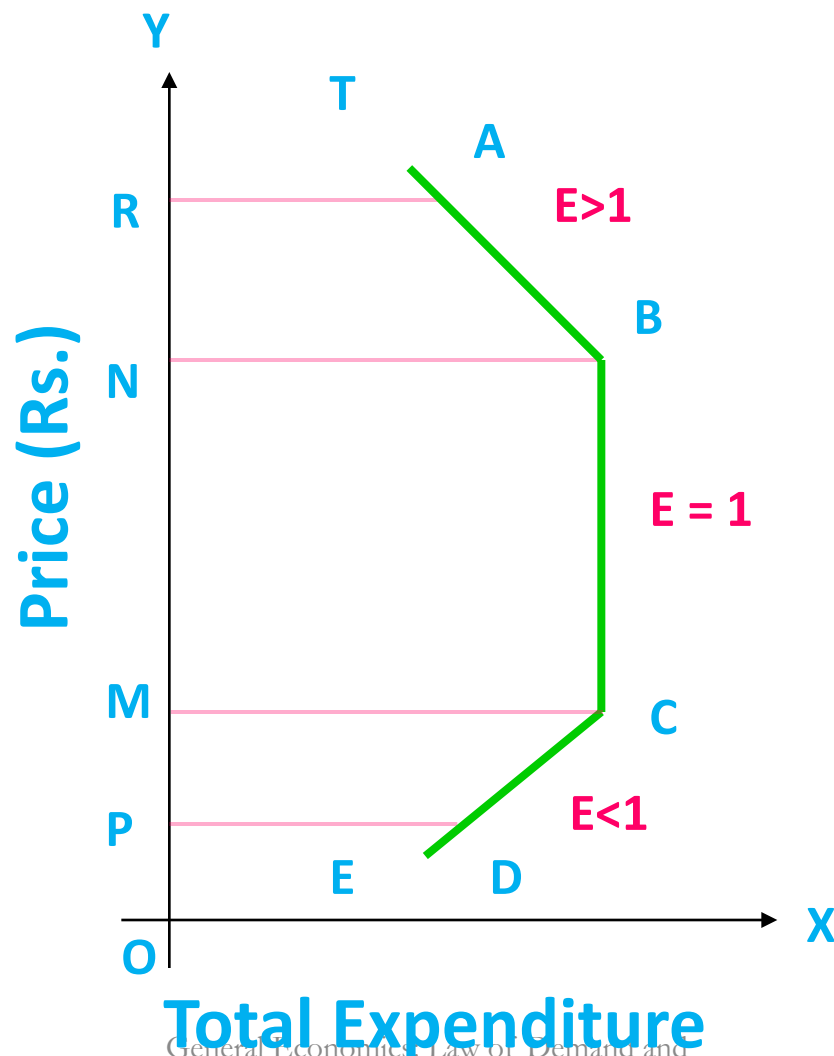
Total Expenditure (Outlay) Method

- This Method was evolved by Dr. Alfred Marshall.
- According to this Method, To Measure the Elasticity of Demand it is Essential to Know How Much & In What Direction the Total Expenditure has Changed as a Result of Change in the Price of a Good.

Total Expenditure (Outlay) Method

Elasticity of Demand	Price	Total Expenditure
Greater than Unity i.e. $E_p > 1$	 	 
Unity i.e. $E_p = 1$	Same Same	Unchanged Unchanged
Less than Unity i.e. $E_p < 1$	 	 

Total Expenditure (Outlay) Method



Determinants of Price Elasticity of Demand

- Availability of Substitutes
- Position of Commodity in Consumer's Budget
- Nature of Need that a Commodity Satisfies
- Number of Uses to which a Commodity is Put
- Period
- Consumer Habits

Income Elasticity of Demand

- Income Elasticity of Demand is the Degree of Responsiveness of Quantity Demanded of a Good to a Small Change in the Income of Consumer.

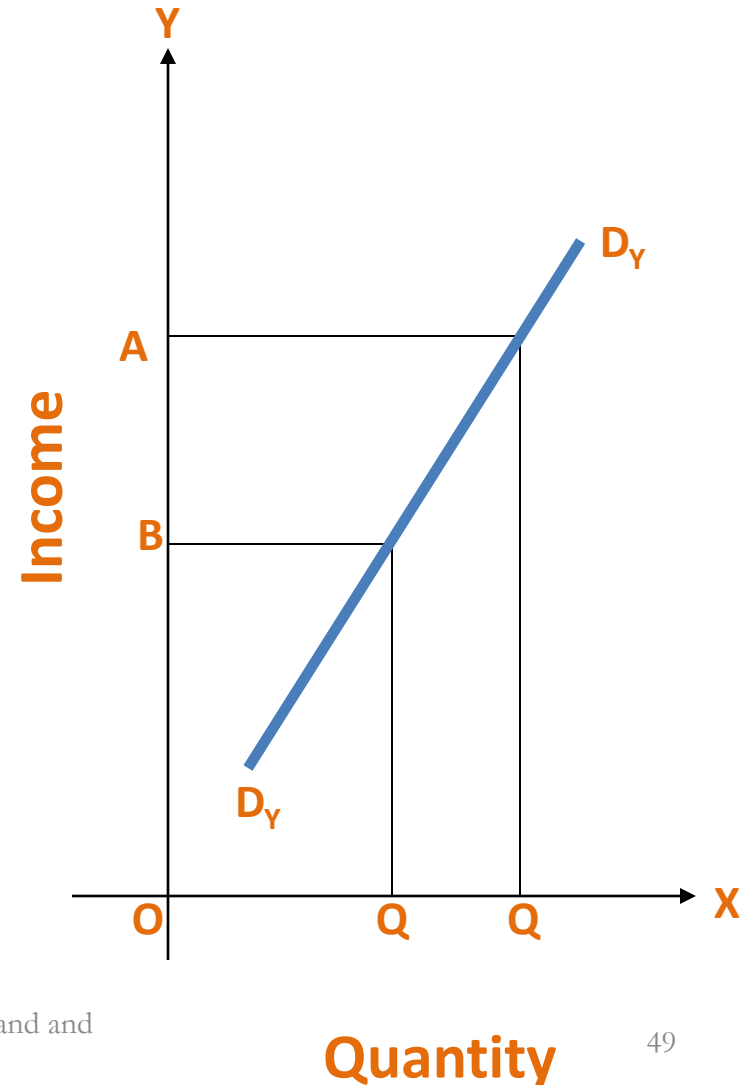
$$E_y = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Income}}$$

Degrees of Income Elasticity of Demand

- **Positive Income Elasticity of Demand**
 - **Unitary Income Elasticity of Demand**
 - **Less than Unitary Income Elasticity of Demand**
 - **More than Unitary Income Elasticity of Demand**
- **Negative Income Elasticity of Demand**
- **Zero Income Elasticity of Demand**

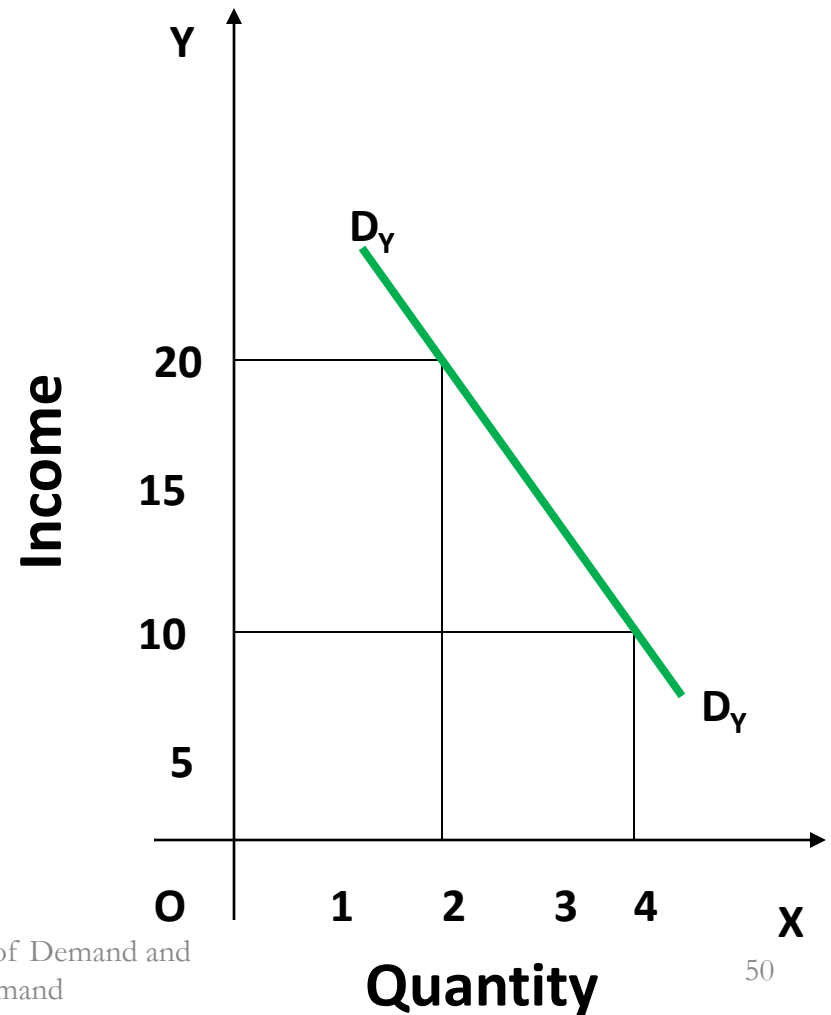
Positive Income Elasticity of Demand

- Income Elasticity of Demand for a Good is Positive, When with an Increase in the Income of a Consumer, his Demand for the Good Increases and Vice Versa.
- It is Positive in case of Normal Goods.



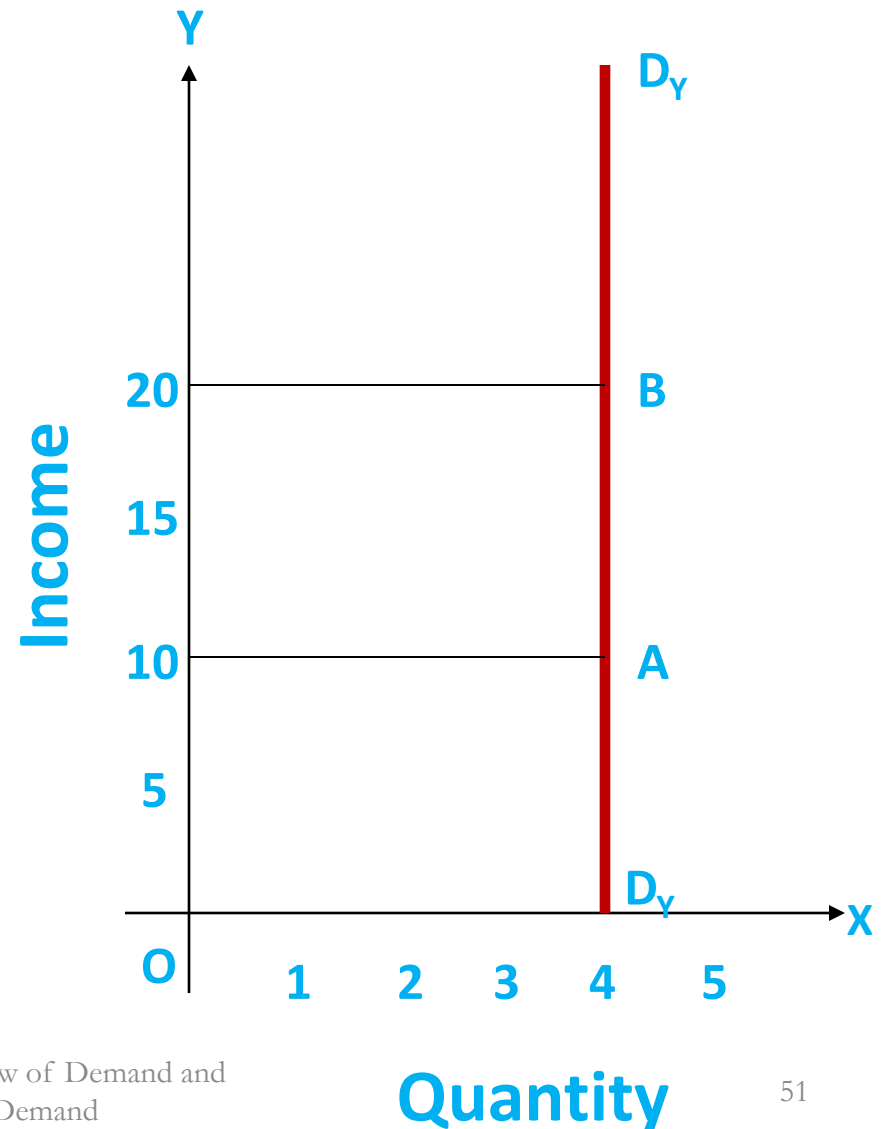
Negative Income Elasticity of Demand

- Income Elasticity of Demand is Negative when Increase in the Income of the Consumer is Accompanied by Fall in Demand of a Good
- It is Negative in case of Inferior Goods which are known as Giffen Goods.



Zero Income Elasticity of Demand

- Income Elasticity of Demand is Zero, When Change in the Income of Consumer evokes No Change in his Demand.
- Demand for Necessaries like oil, salt, etc., have Zero Income Elasticity of Demand.



Cross Elasticity of Demand

- Cross Elasticity of Demand is a Change in the Demand of One Good in Response to a Change in the Price of Another Good.

$$E_c = \frac{\Delta q_x}{\Delta p_y} \times \frac{p_y}{q_x}$$

Where,

E_c = Cross Elasticity

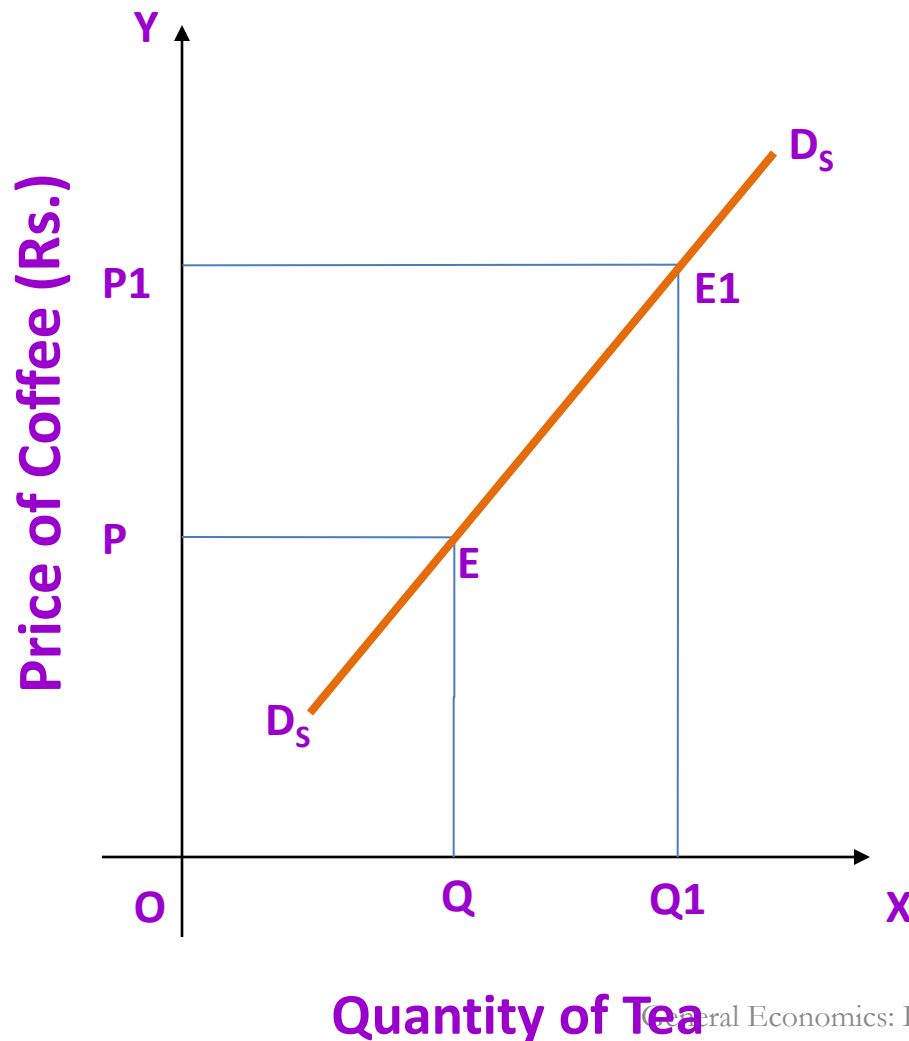
q_x = Original Q.D. of X

Δq_x = Change in Q.D. of X

p_y = Original Price of Y

Δp_y = Change in Price of Y

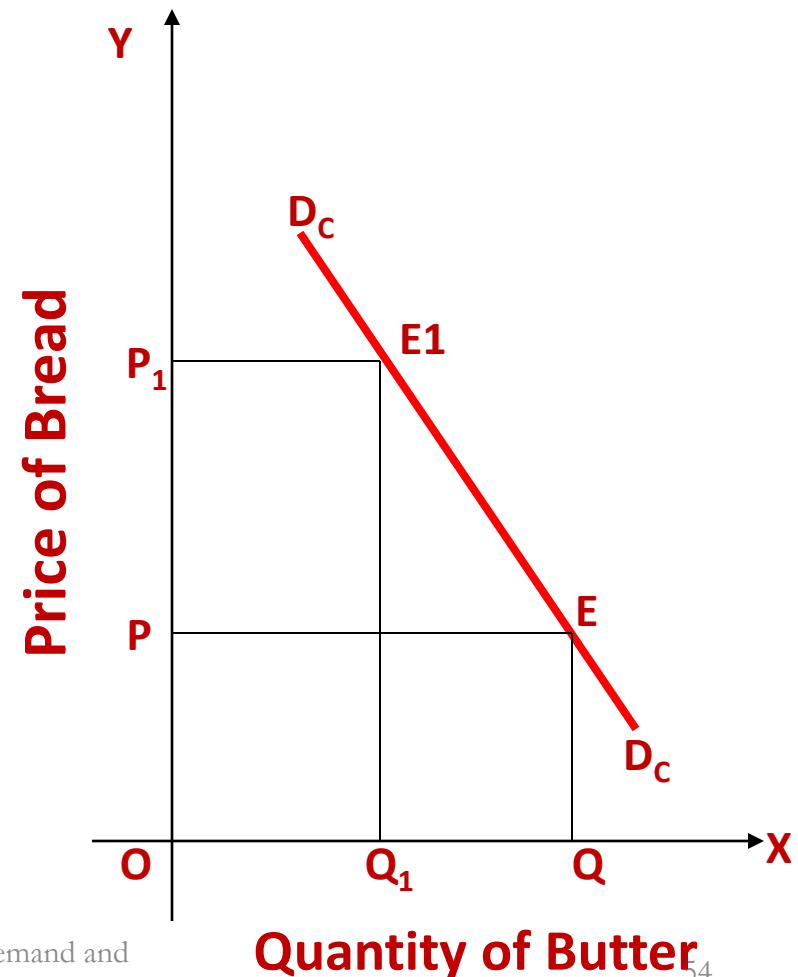
Positive Cross Elasticity of Demand



- It is positive in case of Substitute Goods.
- For example, Rise in the Price of Coffee will lead to Increase in Demand for Tea.
- The Curve slopes Upward from Left to Right.

Negative Cross Elasticity of Demand

- It is Negative in Case of Complementary Goods.
- For example, Rise in Price of Bread will bring Down the Demand for Butter.
- The Curve slopes Downwards from Left to Right.



Zero Cross Elasticity of Demand

- **Cross Elasticity of Demand is Zero when Two Goods are Not Related to each other.**
- **For example, Rise in the Price of Wheat will have No Effect on the Demand for Shoes.**

Q 1

**The Concept of Elasticity of Demand
was developed by:**

- a) Alfred Marshall**
- b) Edwin Camon**
- c) Paul Samuelson**
- d) Fredric Bonham**

Q 2

Demand Curve in most cases Slopes

- a) **Downward towards Right**
- b) **Vertical And Parallel to Y-axis**
- c) **Upward Towards Left**
- d) **Horizontal And Parallel to X-axis**

Read the following Data & Answer Q3 to Q8

- XYZ are 3 Commodities where X & Y are Complements whereas X & Z are Substitutes.
- A Shopkeeper sells Commodity X at Rs.40 per piece. At this price he is able to sell 100 pieces of X per month. After some time he decreases the price of X to Rs. 20. Following the Price Decrease:
 - He is able to sell 150 pieces of X per month
 - The Demand for Y increases from 25 units to 50 units
 - The Demand for Commodity Z decreases from 150 to 75 units

Q 3

The Price Elasticity of Demand when the price of X decreases from Rs.40 per piece to Rs.20 per piece will be equal to:

- a) 1.5**
- b) 1.0**
- c) 1.66**
- d) 0.6**

Q 4

**The Cross Elasticity of Monthly Demand for Y
When the Price of X Decrease from Rs.40 to
Rs.20 is Equal to:**

- a) **+1**
- b) **-1**
- c) **-1.5**
- d) **+1.5**

Q 5

The Cross Elasticity of Z when the Price of X Decreases from 40 to 20 is Equal to:

- a) **-0.6**
- b) **+0.6**
- c) **-1**
- d) **+1**

Q 6

What can be said about Price Elasticity of Demand for X?

- a) Demand is Unit Elastic**
- b) Demand is Highly Elastic**
- c) Demand is Perfectly Elastic**
- d) Demand is Inelastic**

Q 7

Suppose Income of the Residents of Locality increase by 50% & the Quantity of X Commodity increases by 20%. What is Income Elasticity of Demand for Commodity X?

- a) 0.6**
- b) 0.4**
- c) 1.25**
- d) 1.35**

Q 8

We can say that Commodity X in Economics is a/an

- a) Luxury Good**
- b) Inferior Good**
- c) Normal Good**
- d) None of the Above**

Q 9

**Positive Income Elasticity implies that as
Income Rises, Demand for the
Commodity**

- a) Rises**
- b) Falls**
- c) Remains Unchanged**
- d) Becomes Zero**

Q 10

The 'Substitution Effect' takes place due to Change in

- a) **Income of the Consumer**
- b) **Prices of the Commodity**
- c) **Relative Prices of the Commodity**
- d) **All of the Above**

Q 11

In Case of Inferior Goods, Income Elasticity is:

- a) Zero**
- b) Positive**
- c) Negative**
- d) None**

Q 12

In Case of Giffen Goods, Demand Curve will Slope:

- a) Upward**
- b) Downward**
- c) Horizontal**
- d) Vertical**

Q 13

Cross Elasticity of Demand between Tea & Coffee is:

- a) Positive**
- b) Negative**
- c) Zero**
- d) Infinity**

Q 14

The Exception to the Law of Demand are:

- a) Veblen Goods**
- b) Giffen Goods**
- c) Both**
- d) None**

Q 15

If the Income Elasticity is Greater than One, the commodity is :

- a) **Necessity**
- b) **Luxury**
- c) **Inferior Goods**
- d) **None of these**

Q 16

**When Quantity Demanded changes by
Larger Percentage than does Price,
Elasticity is termed as:**

- a) Inelastic**
- b) Perfectly Elastic**
- c) Elastic**
- d) Perfectly Inelastic**

Q 17

If the Price of Good A increases relative to the Price of Substitute B & C, the Demand for:

- a) B will Increase**
- b) C will Increase**
- c) B & C will Increase**
- d) B & C will Decrease**

Q 18

Contraction of Demand is the Result of:

- a) Decrease in the number of Consumers**
- b) Increase in the Price of the Good Concerned**
- c) Increase in the Prices of Other Goods**
- d) Decrease in the Income of Purchasers**

Q 19

In case of Straight Line Demand Curve meeting the two axes, the Price Elasticity of Demand at the mid-point of the line would be:

- a) 0
- b) 1
- c) 1.5
- d) 2

Q 20

If the Demand of a Good is Inelastic, an increase in its price will cause the Total Expenditure of the Consumers of the Good to:

- a) **Remain the Same**
- b) **Increase**
- c) **Decrease**
- d) **Any of These**

Q 21

**All of the Following are Determinants
of Demand Except**

- a) Taste & Preferences**
- b) Quantity Supplied**
- c) Income**
- d) Price of Related Goods**

Q 22

The Law of Demand refers to_____

- a) **Price-Supply Relationship**
- b) **Price-Cost Relationship**
- c) **Price-Demand Relationship**
- d) **Price-Income Relationship**

THE END

*Law of Demand &
Elasticity of Demand*