Elasticity of Demand and Supply

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Elasticity of Demand

Elasticity of demand refers to the degree of responsiveness of demand due to change in the determinants of demand. Or elasticity of demand is the rate of change in quantity demand with respect to the rate of change in determinants. Therefore, the percentage change in demand for a commodity due to the percentage change in price, income etc. is termed as elasticity of demand. As we know that demand is of three types, so elasticity of demand is also three types.

Types of elasticity of demand:

1. Price elasticity of demand. (Ep)
2. Income elasticity of demand. (Ey)
3. Cross elasticity of demand. (Ec)

Contd…

1. Price elasticity of demand:

It is the responsiveness of quantity demanded of a commodity due to a change in its price.

Price elasticity of demand: $E_p = \dfrac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$

$$= -\ \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Where,

Q   = Initial quantity demanded

ΔQ   = Change in quantity demanded

P   = Initial price

ΔP   = Change in price

E_P = Coefficient of price elasticity of demand

Methods of Measuring Price Elasticity of Demand

**1. Percentage Method:** *Percentage method is also called proportionate method. This method measures price elasticity of demand by dividing the percentage change in the quantity demanded for a commodity by the percentage change in its price.*

2. Total Outlay Method: *Total outlay method is also called total expenditure method. It was developed by the famous classical economist **Prof. Dr. Alfred Marshall**. In this method, the direction of change in total expenditure determines the value of price elasticity of demand. In other words, price elasticity of demand is measured by comparing total expenditure made by the consumer before and after the change in price of the commodity.*

3. Point Method: *Point method is also called geometrical method of measuring price elasticity of demand. This method is useful to measure elasticity of demand when there is very small change in price and quantity demanded. It measures elasticity of demand at a particular point on a given demand curve.*

4. Arc Method: *Arc method of measuring price elasticity of demand is relevant where there is substantial change in price and quantity demanded. This method measures the elasticity of demand between two points on the same demand curve.*

# Percentage Method.

❖ **Types Of Price Elasticity Of Demand**
   a) Perfectly elastic demand (Ep = ∞)
   b) Perfectly inelastic demand (Ep = 0)
   c) Unitary elastic demand (Ep = 1)
   d) Relatively elastic demand (Ep > 1)
   e) Relatively inelastic demand (EP < 1)

a. Perfectly elastic demand (Ep=∞ ∞): Demand is said to be perfectly elastic if negligible change in price causes infinitely large change in the quantity demanded.
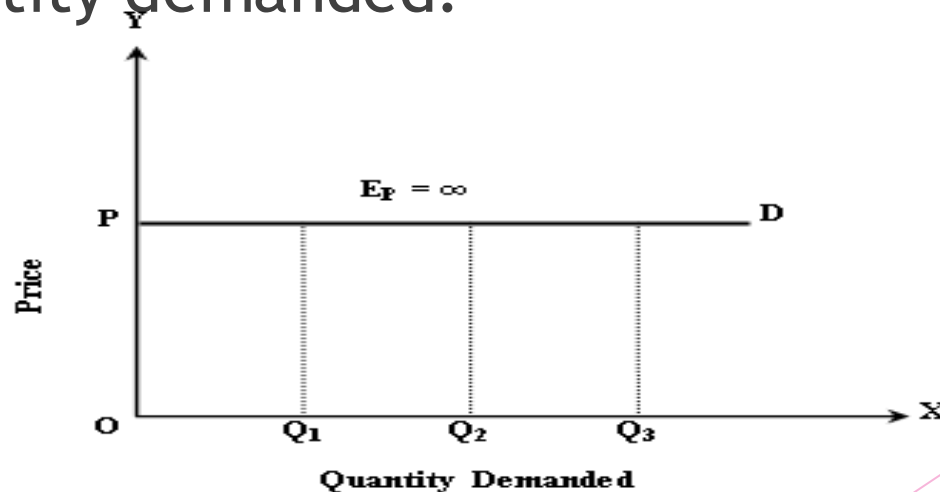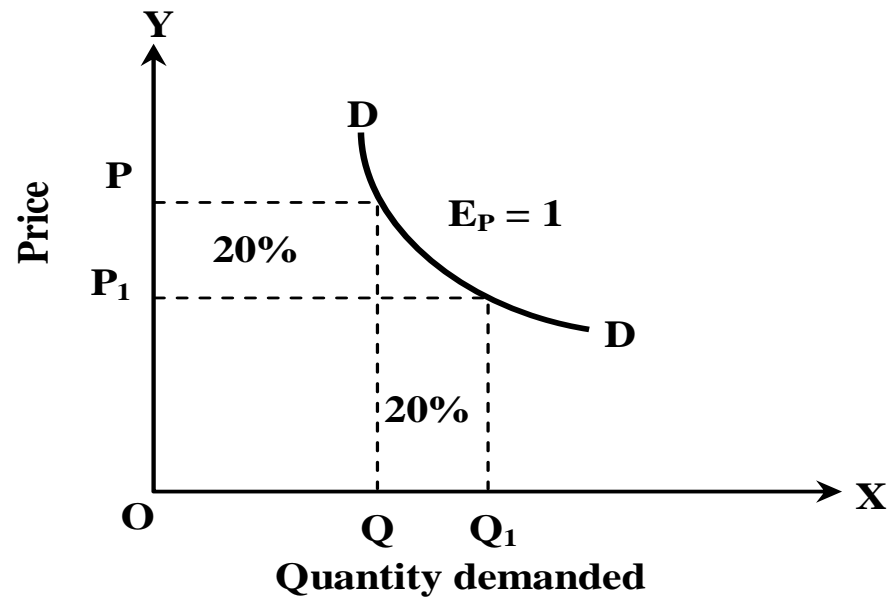
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b. Perfectly inelastic demand (Ep = 0): Perfectly inelastic demand is defined as the change in price causes no change in quantity demanded of the commodity. This type of elasticity is found in case of very essential commodities like medicine.
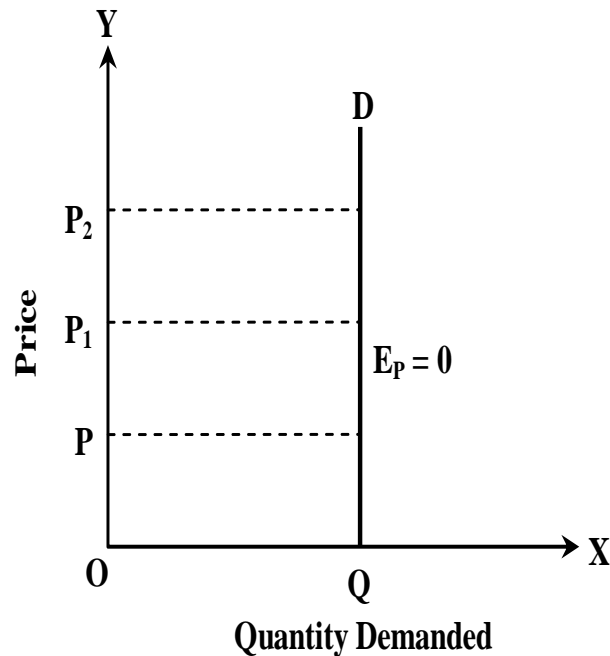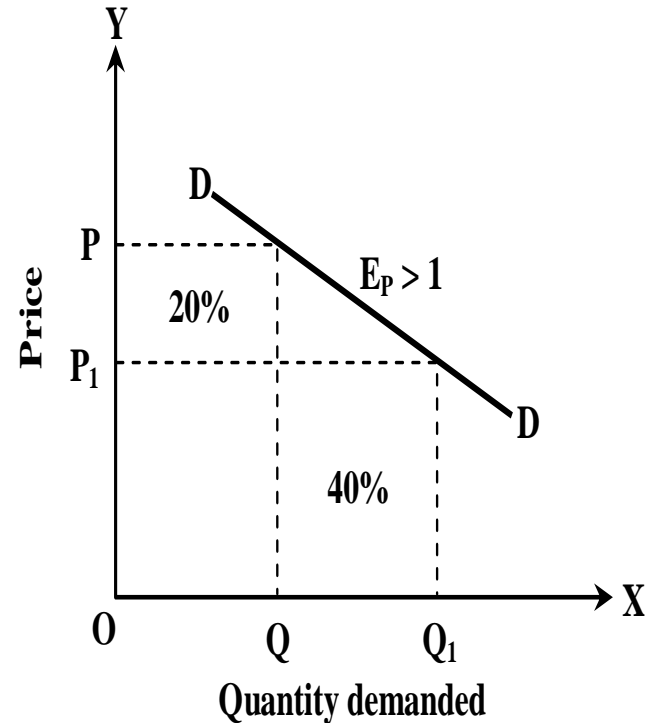

Quantity Demanded

Contd….

c. Unitary elastic demand (Ep = 1): If the percentage change in quantity demanded is equal to the percentage change in price is called unitary elastic demand.

Contd…..

d. Relatively elastic demand (Ep > 1): If the percentage change in the quantity demanded for a commodity is more than percentage change in its price then, it is known as relatively elastic demand.

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E. Relatively inelastic demand (Ep < 1): Demand is said to be relatively inelastic when the percentage change in quantity demanded for a commodity is less than the percentage change in its price.
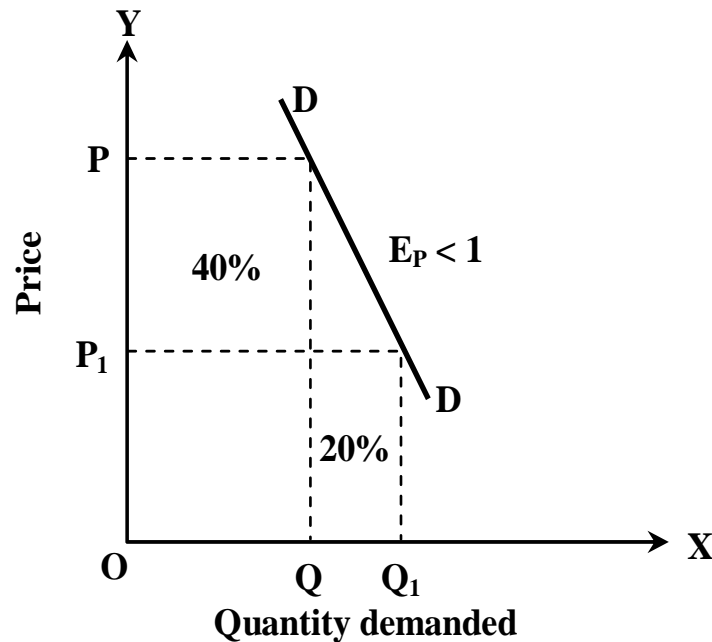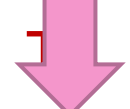
2. Total outlay method:

price elasticity of demand is measured by comparing total expenditure made by the consumer before and after the change in price of the commodity.

Total outlay / expenditure = Price × Quantity purchased

It has three possibilities:

a) **Elasticity of demand greater than unity ($E_P > 1$):**

when ↑↓P   ↓↑ T   (change of price and expenditure in opposite direction)

b) **Elasticity of demand less than unity ($E_P < 1$):**

When ↑↓ P   TE   (change of price & expenditure in same direction)

c) **Elasticity of demand equal to unity ($E_P = 1$):**

When ↑↓ P increase or decrease but TE remains same.(change in price but no change in expenditure)

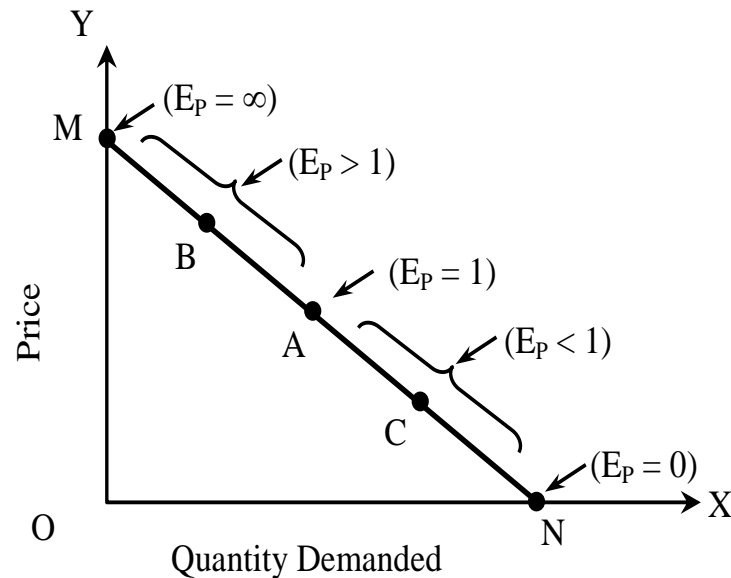(P = Price, TE = Total Expenditure)

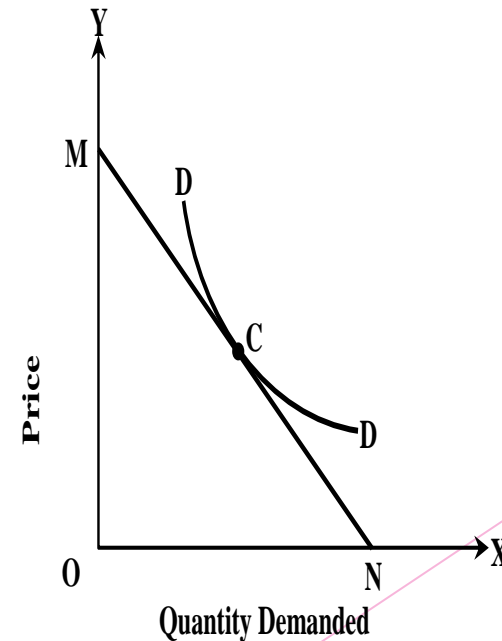# Tabular and graphical representation
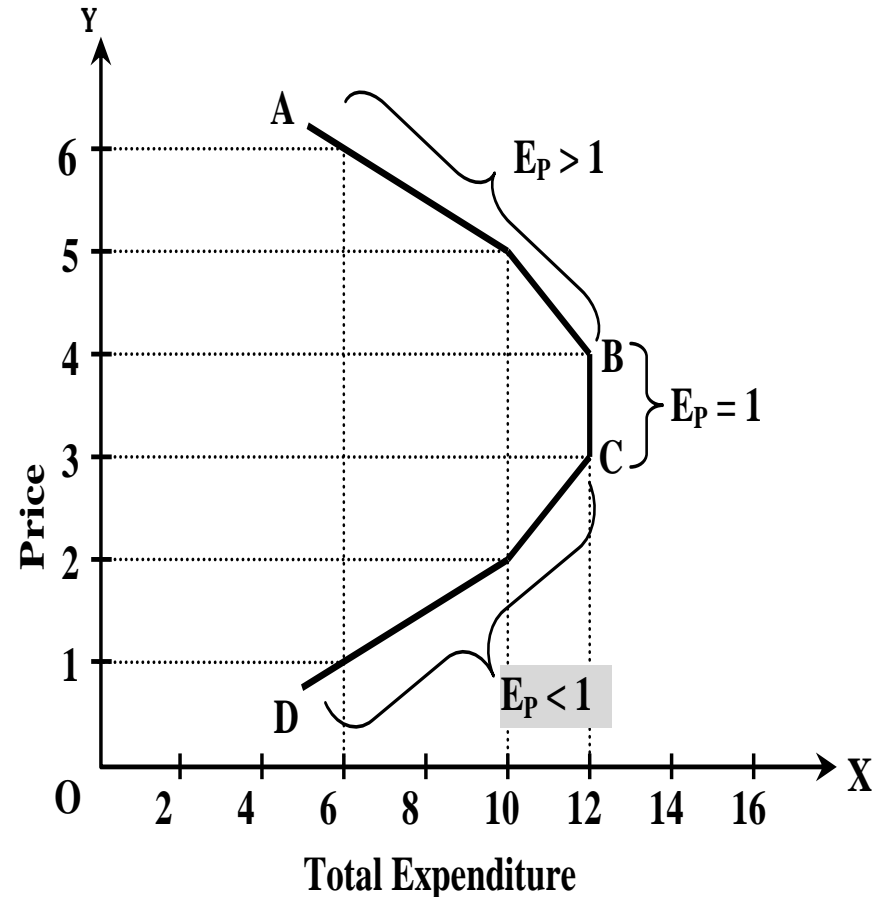
3. Point / geometric method:

$$Ep = \frac{\text{lower segment}}{\text{upper segment}}$$

This method can be explained by the help of both linear and non-linear demand curve.

## i. Linear demand curve   ii. Non-linear

4. Arc method

$$\text{(Ep on arc AB} = \left(\frac{Q2 - Q_1}{P_2 - P_1} \times \frac{P_1 + P_2}{Q_1 + Q_2}\right)$$

The point method of measuring elasticity at two points on a demand curve gives different values of price elasticity of demand. To avoid this discrepancy, elasticity for the arc is calculated by taking the average price and quantity demanded. Arc method is relevant where there is substantial change in price and quantity demanded.

This method measures the elasticity of demand between two points on the same demand curve.

Mathematically, AB = $\left(\frac{Q2 - Q_1}{P_2 - P_1} \times \frac{P_1 + P_2}{Q_1 + Q_2}\right)$

Quantity Demanded
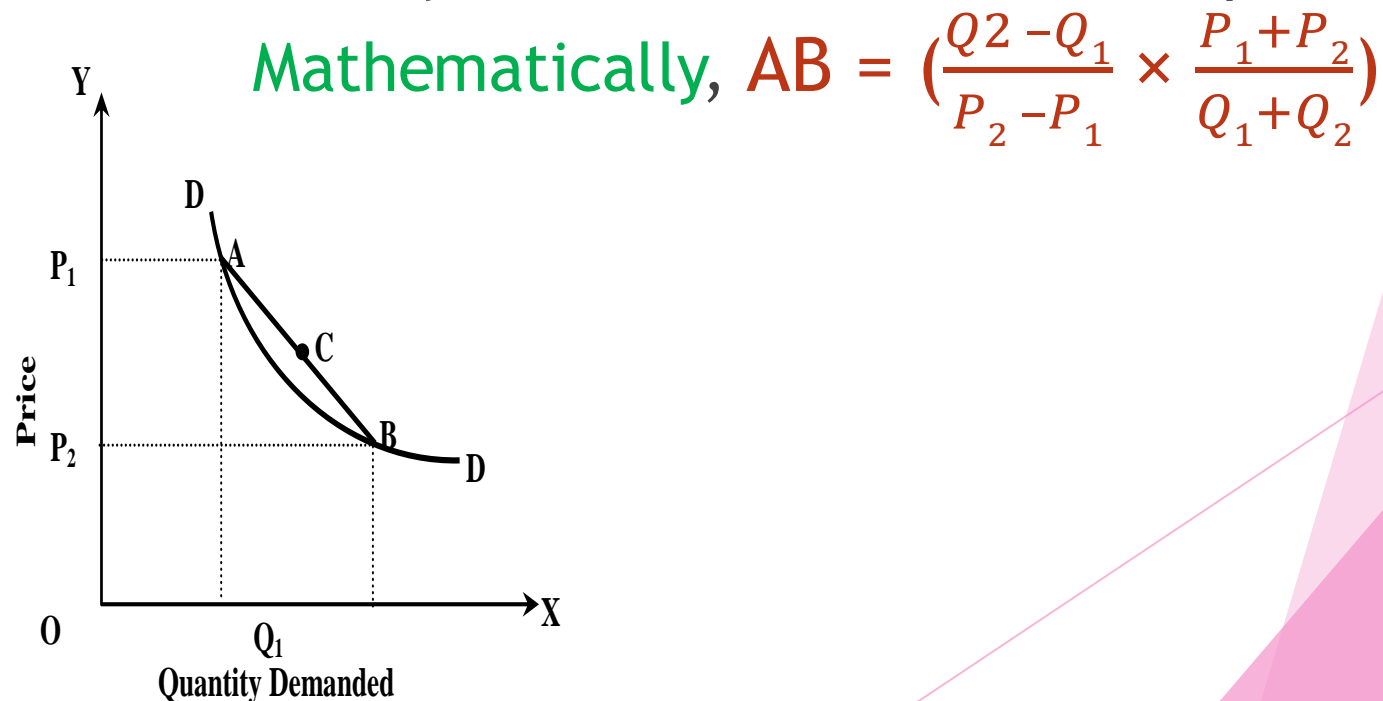
Determinants of Elasticity of Demand

1. Nature of the commodity.
2. Availability of Substitute goods.
3. Possibility of postponement the consumption.
4. Influence of habit of consumers.
5. Consumer's income level.
6. Time and uses of goods.
7. Price level.
8. Proportion of expenditure.

Determinants of Elasticity of Demand

	Elastic	Inelastic
mmodity	Luxurious	Most essential
	Available of substitutes	unavailable of substitutes
ners	Very high & very low income group	Moderate income group
ers	Non-habitual	Habitual
ses	can be postponed	cannot be postponed
otion	longtime Moderate price goods	very short time very expensive & cheap goods

2. Income Elasticity of Demand:

It is the responsiveness in quantity demanded of a commodity due to a change in income of a consumer.

Income elasticity of demand: $E_y = \dfrac{\%\ change\ in\ quantity\ demanded}{\%change\ in\ income}$

$$= \frac{\Delta Q}{\Delta Y} \cdot \frac{Y}{Q}$$

Where,

Q = Initial quantity demanded

ΔQ = Change in quantity demanded

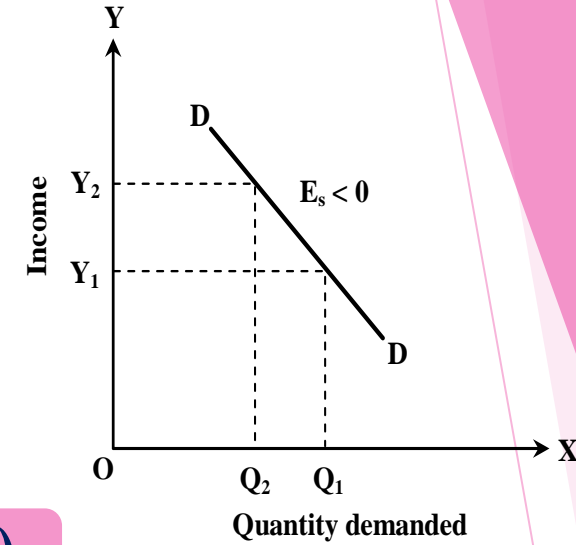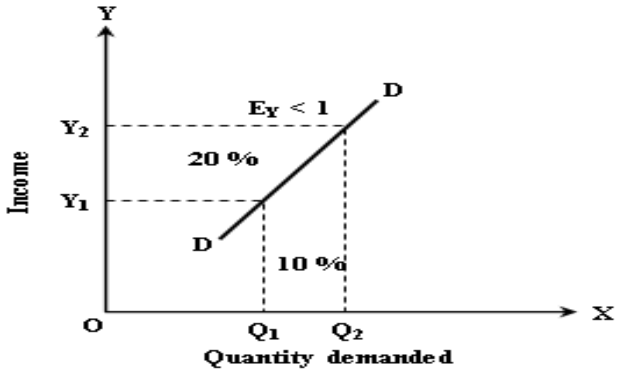Y = Initial income level

ΔY = Change in income level

E_Y = Coefficient of income elasticity of demand
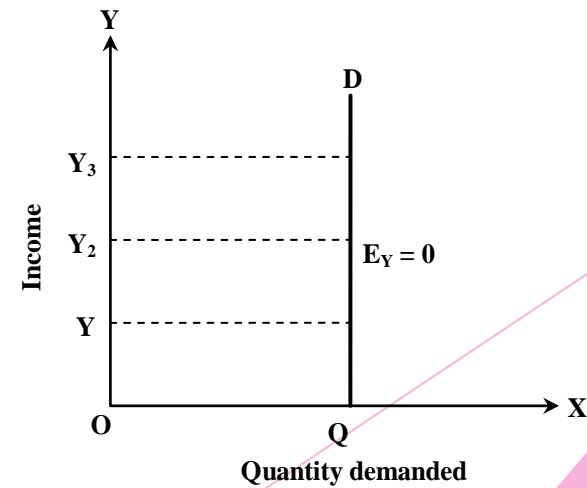
Types Of Income Elasticity Of Demand:

Ey>0 (positive)
Superior goods

Ey<0 (negative)
Inferior goods

Types of
(E_Y)

Ey= 0 (zero)
Most essential Goods

Contd…..

E_Y	Nature/ Types of Commodity		
$E_Y = 0$	Most essential & neutral goods		
$E_Y < 0$	Inferior & low quality goods		
$E_Y > 0$	**Superior & normal good**	$E_Y = 1$	Comforts
		$E_Y < 1$	Necessary
		$E_Y > 1$	Luxury

3. CROSS ELASTICITY OF DEMAND (Ec/E$_{XY}$):

The cross elasticity of demand is defined as the percentage change in the quantity demand for good-X resulting from a percentage change in the price of good-Y.

Cross elasticity of demand: E$_{XY}$ = $\dfrac{\%\ change\ in\ quantity\ demanded\ of\ X\ commmodity}{\%\ change\ in\ price\ of\ Y\ commodity}$

$$= \frac{\Delta QX}{\Delta PY} \cdot \frac{P_Y}{Q_X}$$

Where,

E$_{XY}$ = cross elasticity of demand

P$_Y$ = price of good-Y,

ΔP$_Y$ = change in the price of good-Y

Q$_X$ = quantity of good-X

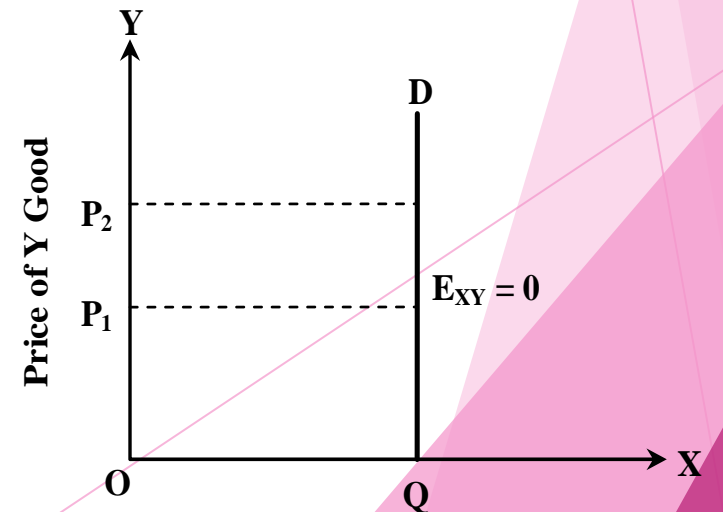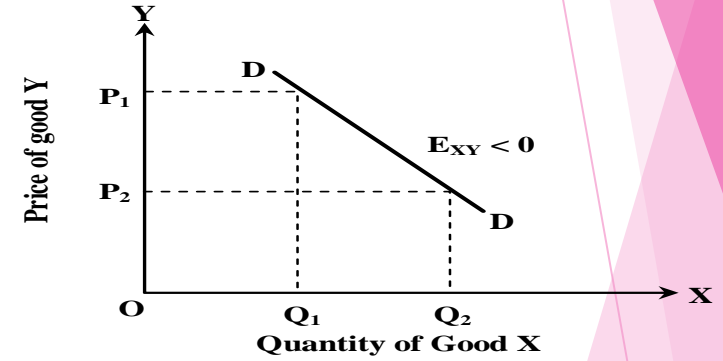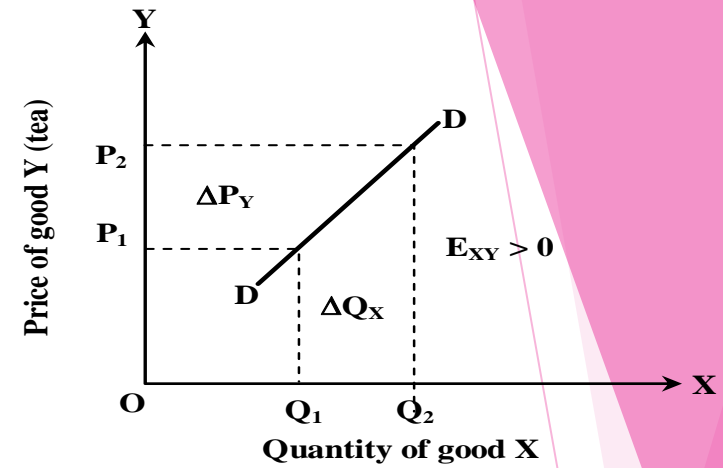ΔQ$_X$ = change in the demand for good-X

Types of Cross Elasticity of Demand

Types of E_{xy}

$E_{xy} > 0$ (positive) Substitute goods

$E_{xy} < 0$ (negative) Complement goods

$E_{xy} = 0$ (zero) Unrelated goods.

Elasticity of Supply (Es)

Elasticity od supply is the ratio of percentage change in quantity supplied to the percentage change in price of the same commodity.

$$E_S = \frac{\% \text{ change in quantity supplied}}{\% \text{change in price}} \qquad = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Where,

Q   = initial quantity supplied

ΔQ = change in quantity supplied
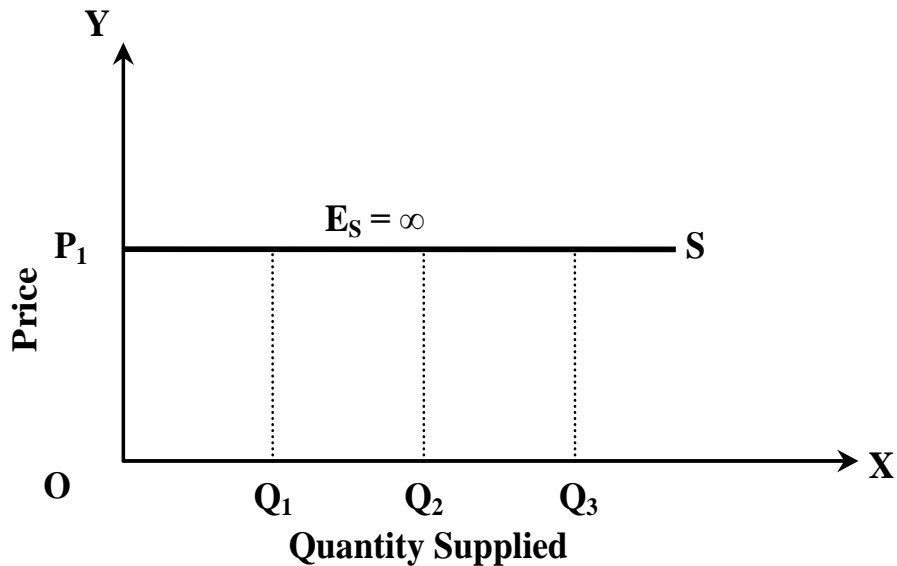
P   = Initial price

ΔP   = Change in price

E_S= coefficient of price elasticity of supply

Types of Price Elasticity of Supply

1. **Perfectly elastic supply ($E_P = \infty$)**

   % change in P = negligible
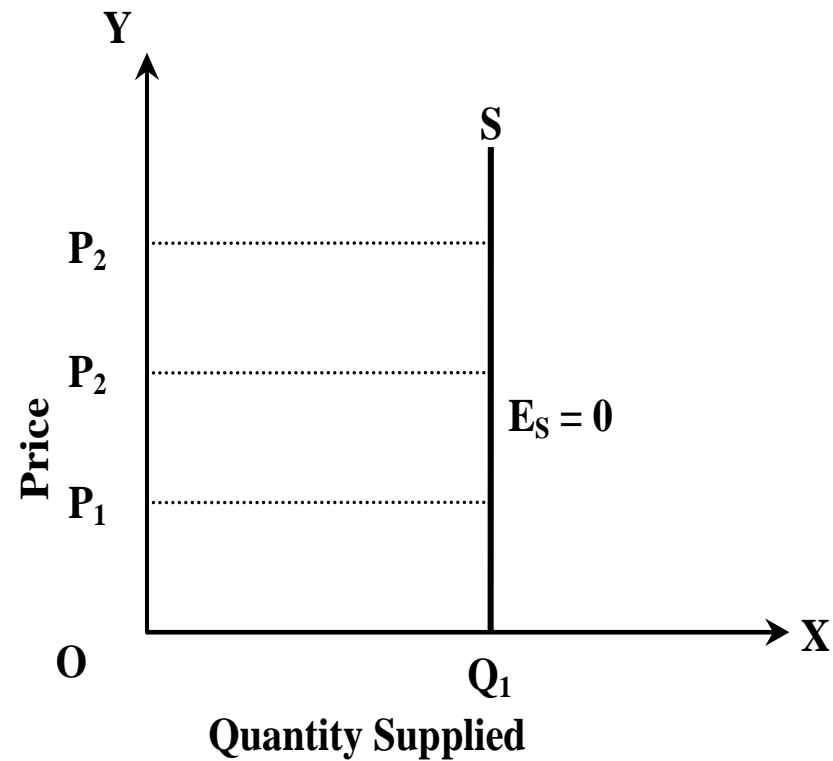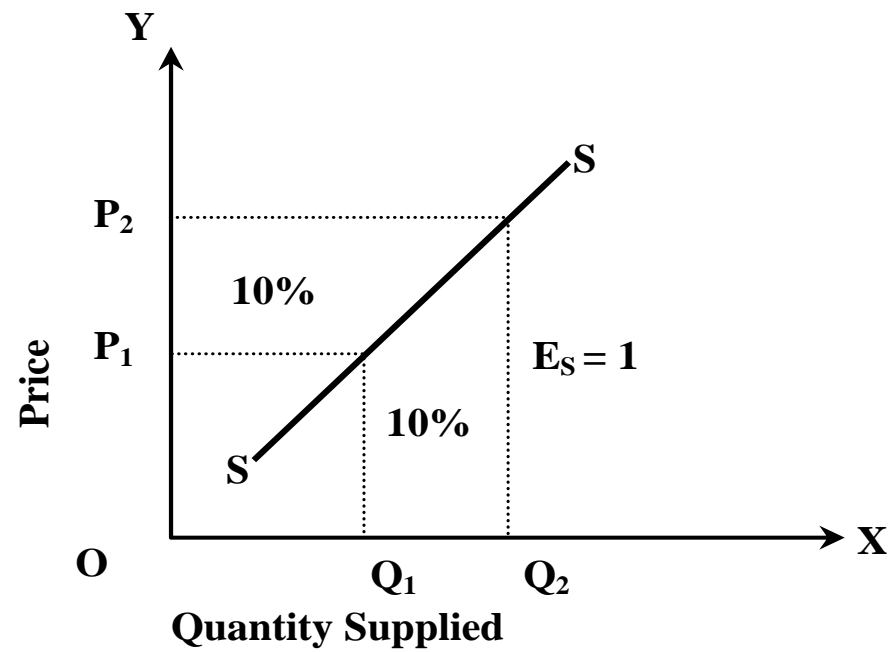
   % change in Q.S = infinite.

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2. **Perfectly inelastic supply ($E_P = 0$)**

% change in price has no effect in Q.S.

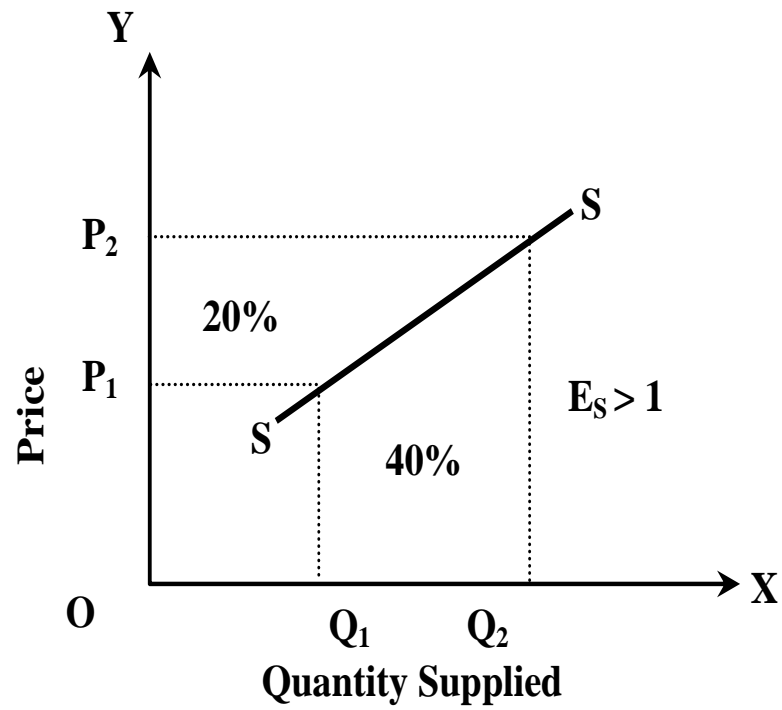## 3. Unitary elastic supply ($E_P = 1$)

%change in P = % change in Q.S
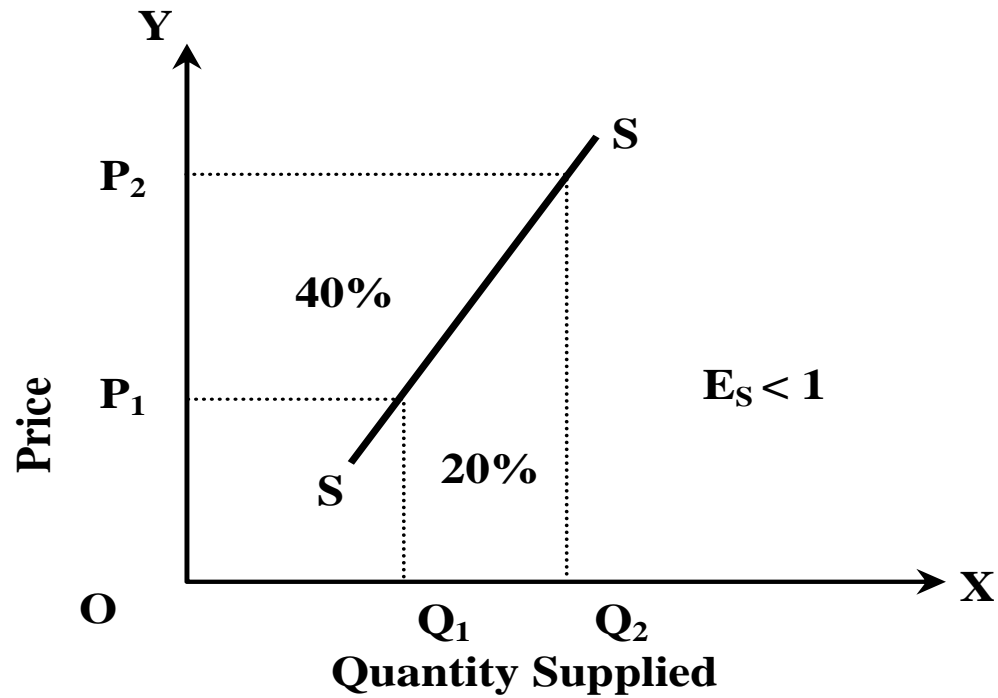
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4. Relatively elastic supply (E_P > 1)

% change in Q.S > % change in P

Contd....

5. Relatively inelastic supply (E$_P$ < 1)

▶ **% change in Q.S < % change in P**

Behavior is always greater than Knowledge because in our life there are many situations where knowledge fails but behavior can still handle.