

Definition Of Price Elasticity Of Demand

- The change in the quantity demanded of a product due to a change in its price is known as Price elasticity of demand. Thus, the sensitiveness or responsiveness of demand to change in price is as called elasticity of demand

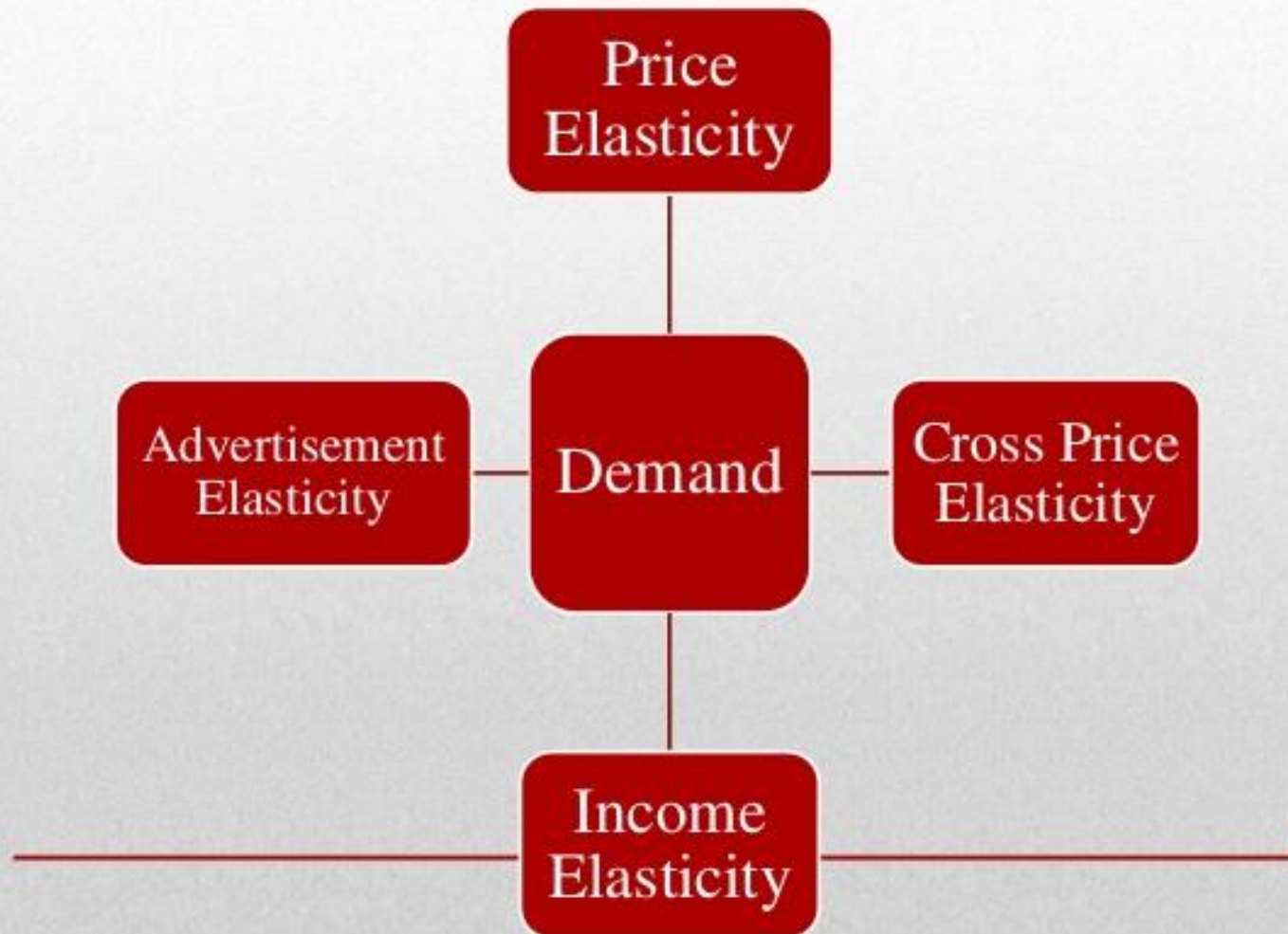
CONCEPTS OF ELASTICITY OF DEMAND

Two Variables are considered while measuring the elasticity of demand :-

- Demand
- Determinants Of Demand

$$\text{Elasticity Of Demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in determinant of demand}}$$

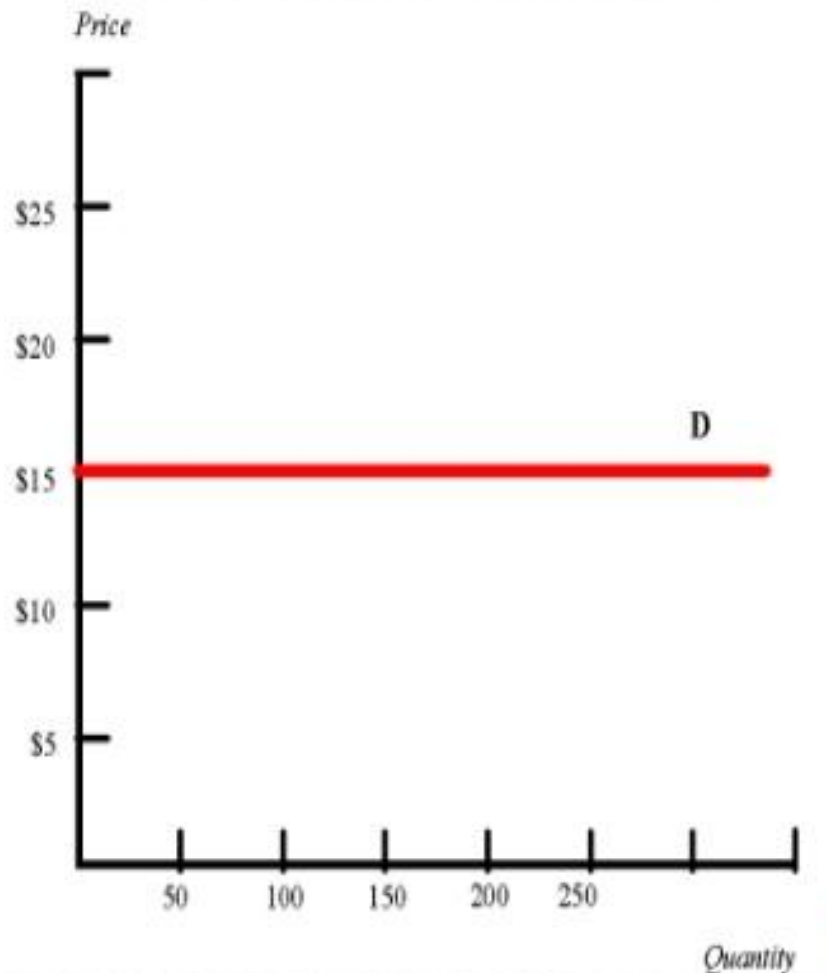
TYPES OF ELASTICITY OF DEMAND



TYPES OF PRICE ELASTICITY



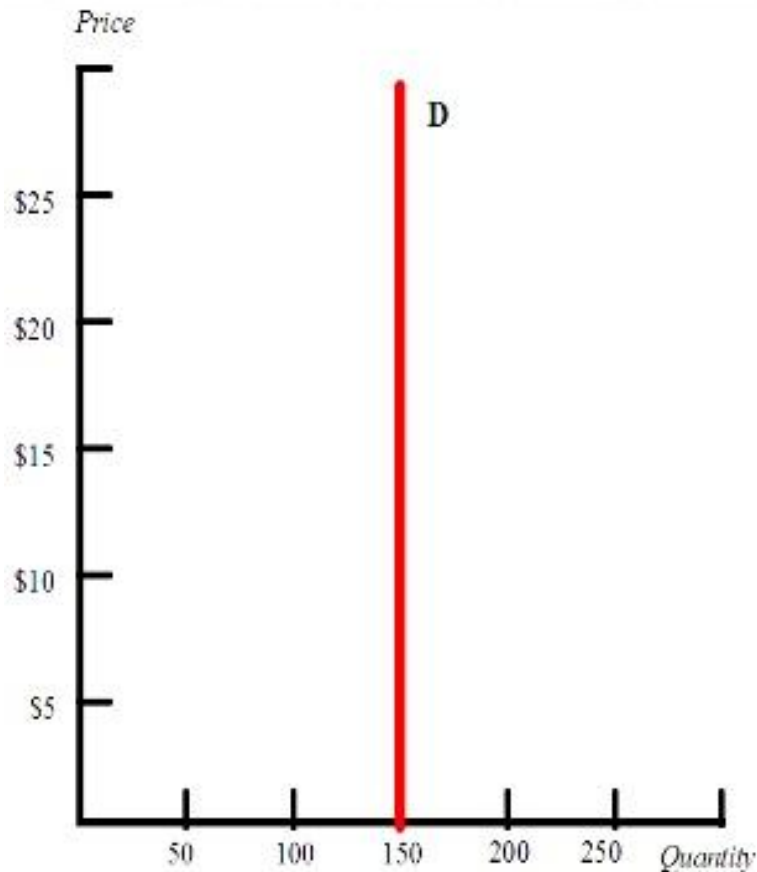
PERFECTLY ELASTIC



Consumers have indefinite demand at a particular price and none at all at an even slightly higher than this given price, demand is PERFECTLY ELASTIC

$$e = \infty$$

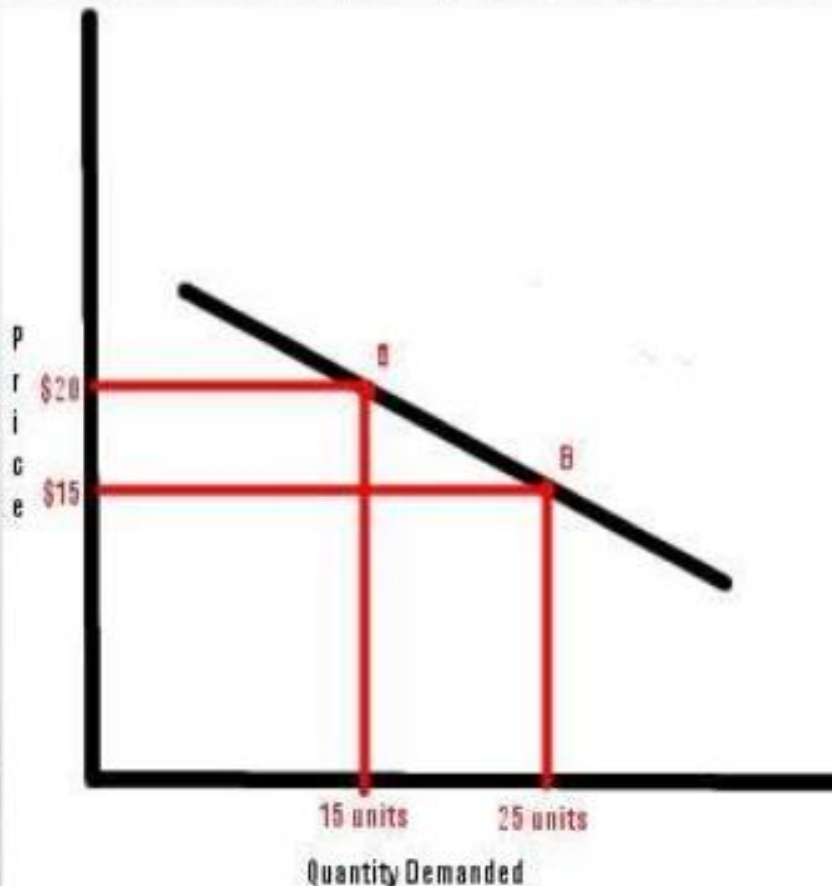
PERFECTLY INELASTIC



When the demand for a commodity shows no response to a change in price/ whatever change in price, the demand remains same, it is called PERFECTLY ELASTIC

$$e = 0$$

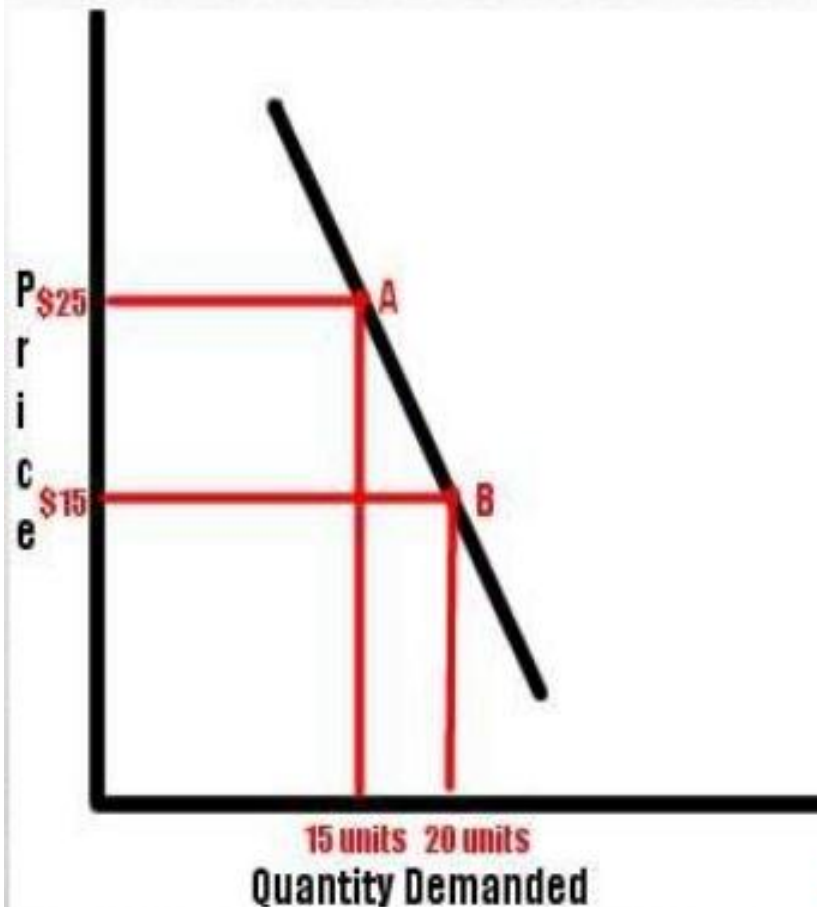
RELATIVELY ELASTIC



When the proportion of change in the quantity demanded is greater than that of price, the demand is said to be RELATIVELY ELASTIC

$$e > 1$$

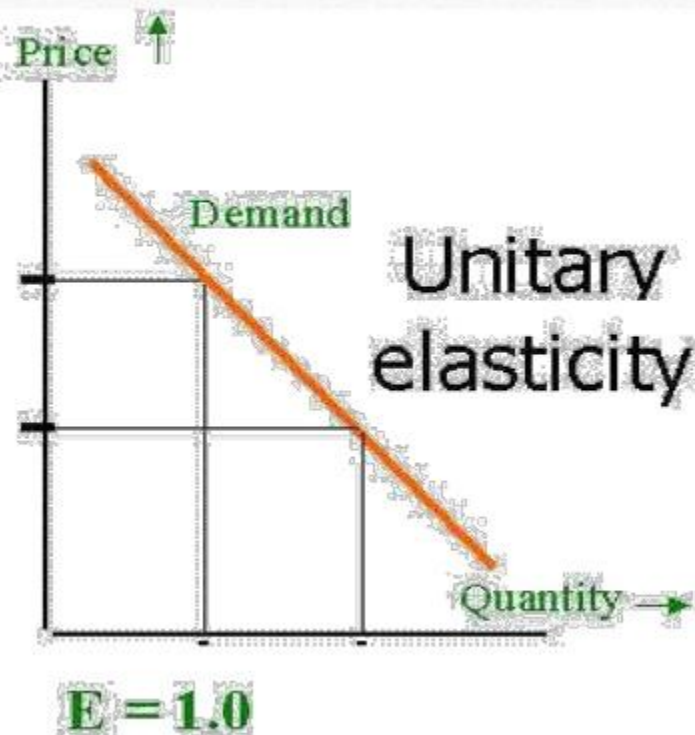
RELATIVELY INELASTIC



When the proportion of change in the quantity demanded is less than that of price the demand is considered to be RELATIVELY INELASTIC

$$e < 1$$

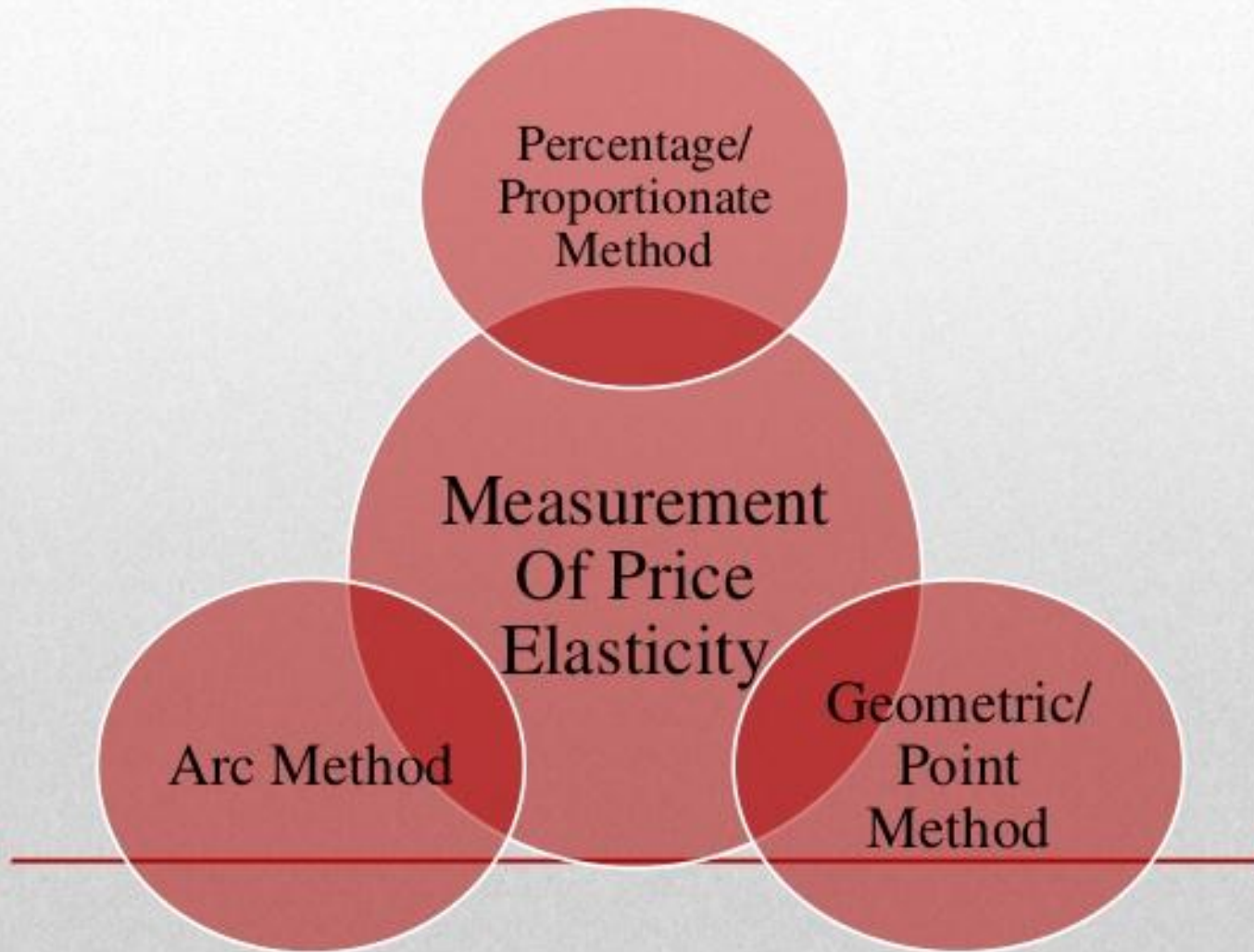
UNITARY ELASTIC



When the proportion of change in demand is exactly the same as the change in price, the demand is said to be UNITARY ELASTIC

$$e = 1$$

MEASUREMENT OF PRICE ELASTICITY



POINT/GEOMETRIC METHOD

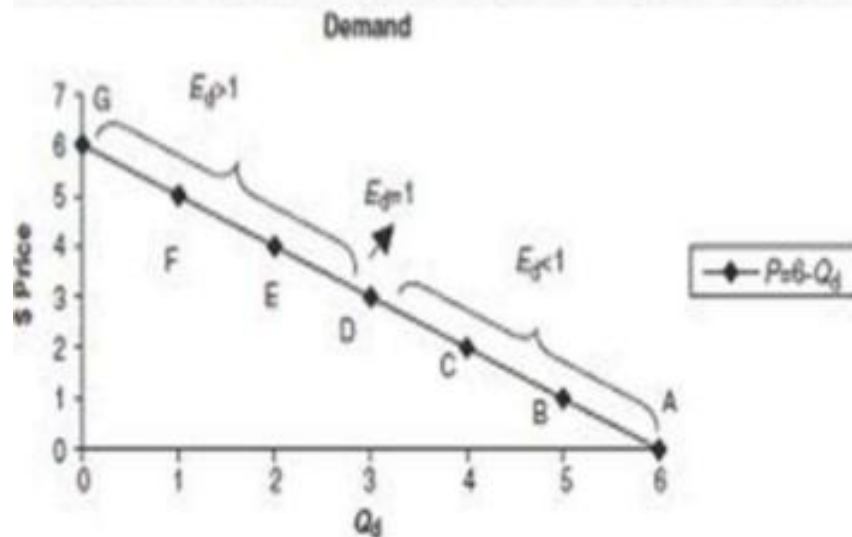
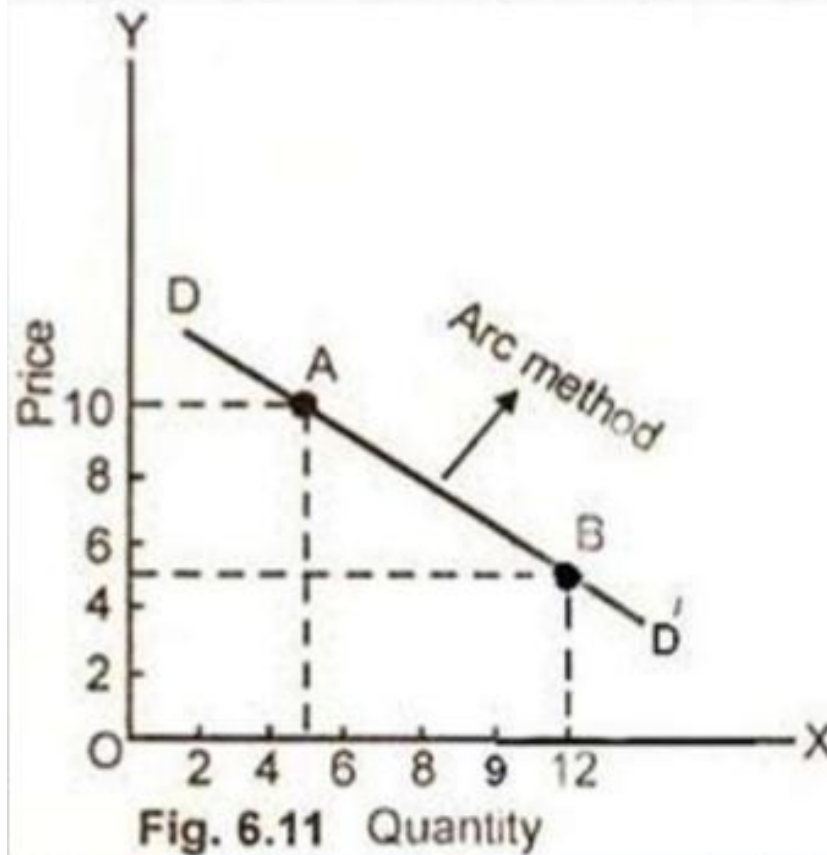


Figure 7.1

This method attempts to measure the price elasticity of demand at a particular point on demand curve

Point Elasticity = $\frac{\text{Lower segment of demand curve below the point}}{\text{Upper segment of demand curve below the point}}$

ARC ELASTICITY OF DEMAND



Arc Elasticity of Demand measures the elasticity at the mid point between two points on a curve

IMPORTANCE OF PRICE ELASTICITY OF DEMAND

- International Trade
- Formulation of government policies
- Factor pricing
- Decisions of Monopolists
- Paradox of poverty amidst plenty

INCOME ELASTICITY OF DEMAND

The income elasticity is defined as a ratio percentage or proportional change in the quantity demanded to the percentage or proportional change in income.

$$\text{Income Elasticity} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

Mathematical Expression

Mathematically, it is expressed as:

$$\text{Income elasticity of demand} = \frac{\% \text{change in quantity demanded}}{\% \text{change in income}}$$

Symbolically, it is expressed as:

$$E_y = \frac{\Delta q}{\Delta y} \times \frac{y}{q}$$

Where,

E_y = Elasticity of demand

q = Original quantity demanded

Δq = Change in quantity demanded

y = Original consumer's income

Δy = Change in consumer's income

Practical Example

Suppose that the initial income of a person is Rs.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.

Solution

Here, $q = 100$ units

$$\Delta q = (40-20) \text{ units} = 20 \text{ units}$$

$$y = \text{Rs.} 2000$$

$$\Delta y = \text{Rs.} (3000-2000) = \text{Rs.} 1000$$

$$\begin{aligned}\therefore E_y &= \frac{\Delta q}{\Delta y} \times \frac{y}{q} \\ &= \frac{20}{20} \times \frac{2000}{1000} \\ &= 2\%\end{aligned}$$

Hence, an increase of Rs.1000 in income i.e. 1% in income leads to a rise of 2% in quantity demanded.

Other Demand Elasticities

- Income Elasticity
 - Types of Goods
 - Normal Goods
 - Inferior Goods
 - Higher income raises the quantity demanded for normal goods but lowers the quantity demanded for inferior goods.

Other Demand Elasticities

- Income Elasticity
 - Goods consumers regard as necessities tend to be income inelastic
 - Examples include food, fuel, clothing, utilities, and medical services.
 - Goods consumers regard as luxuries tend to be income elastic.
 - Examples include sports cars, furs, and expensive foods.

IMPORTANCE OF INCOME ELASTICITY OF DEMAND

- Helps in investment decisions
- Forecasting demand
- Categorizing goods

CROSS ELASTICITY OF DEMAND

The cross elasticity of demand refers to the degree of responsiveness of demand for a commodity to a given change in the price of some related commodity.

$$\text{Cross Elasticity Of Demand} = \frac{\text{Proportionate/percentage change in demand for } x}{\text{Proportionate/percentage change in price of } y}$$

Mathematical Expression

Mathematically, it is expressed as:

$$\text{Cross elasticity of demand} = \frac{\% \text{ change in quantity demanded for good } x}{\% \text{ change in price of good } y}$$

Symbolically, it is expressed as:

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

Where, E_c = Cross elasticity of demand

q_x = initial quantity demanded for good x

Δq_x = change in quantity demanded of good x

p_y = initial price of good y

Δp_y = change in price of good y

Practical Example

Tea and coffee are substitutes to each other. If the price of coffee rises from Rs.10 per 100 grams to Rs.15 per 100 grams.

As a result, consumer demand for tea increases from 30/100 grams to 40/100 grams.

Find out the cross elasticity of demand between tea and coffee.

Solution

Here, If we suppose tea as good x and coffee as good y.

q_x = initial quantity demanded of tea = 30 grams

Δq_x = change in quantity demanded of tea = (40-30) grams = 10 grams

p_y = initial price of coffee = Rs.10

Δp_y = change in price of coffee = Rs. (15-10) = Rs. 5

Now,

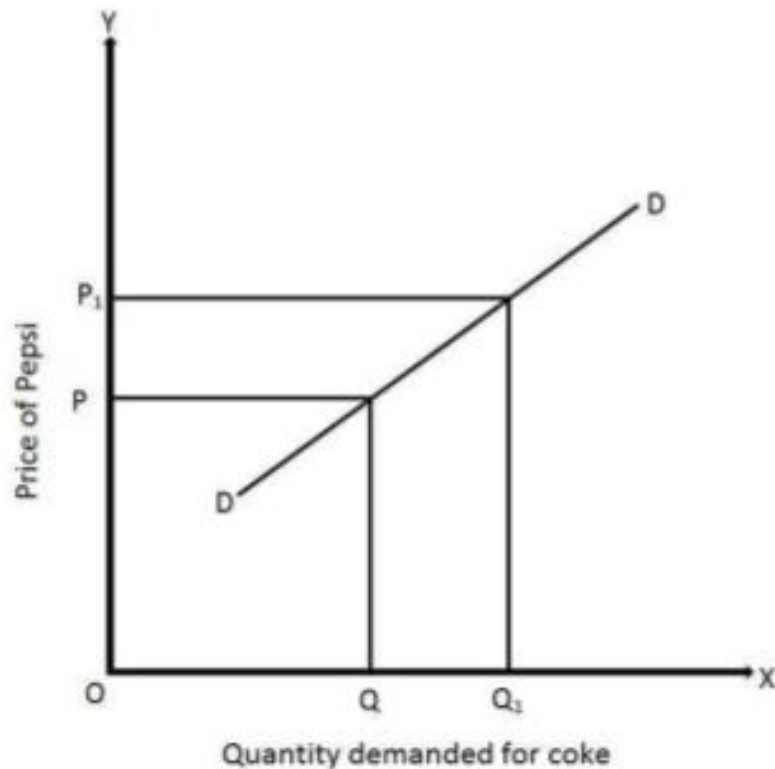
$$\begin{aligned}\therefore E_c &= \frac{\Delta q_x}{\Delta p_y} \times \frac{p_y}{q_x} \\ &= \frac{10}{5} \times \frac{10}{30} \\ &= \frac{2}{3}\end{aligned}$$

The coefficient of cross elasticity is $2/3$ which shows that the quantity demanded for tea increases 2% when the price of coffee rises by 3%.

Types of Cross Elasticity of Demand

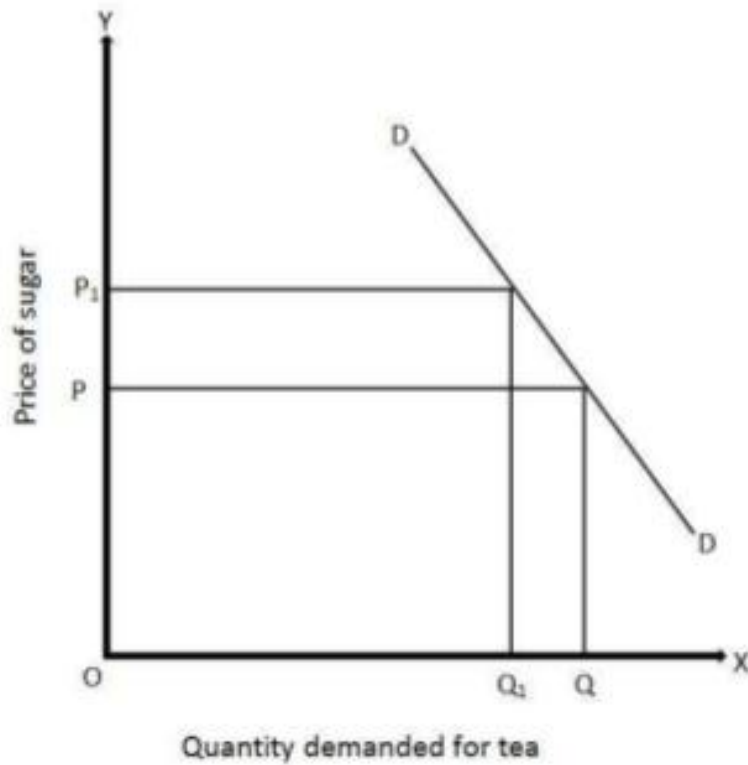
1. Positive cross elasticity of demand ($E_c > 0$)
2. Negative cross elasticity of demand ($E_c < 0$)

Positive cross elasticity of demand ($E_C > 0$)



Rise in price of one good leads to rise in quantity demanded of other good of a similar nature and vice versa

Negative cross elasticity of demand ($E_C < 0$)



Rise in price of one good leads to fall in quantity demanded of its complementary good and vice versa

Importance of CED for businesses

- Firms can use CED estimates to predict:
The impact of a rival's pricing strategies on demand for their own products.
- Pricing strategies for complementary goods:
If firms have a reliable estimate for CED they can estimate the effect, say, of a two-for-one cinema ticket offer on the demand for popcorn



Applications of Cross Elasticity

- Higher indirect taxes on goods such as tobacco – the impact on demand for nicotine patches and other substitutes
- Rise in the price of natural gas – effect on the demand for coal used in power generation