Lesson – 16
Price Elasticity of Demand

Summary

Let us discuss about the word *elastic*. It suggests that an item can be stretched. In economics, when we talk about **elasticity**, we're referring to how much something will stretch or change in response to another variable. Elasticity is an economics concept that measures the responsiveness of one variable to changes in another variable. Demand for a good is said to be "elastic" if a small change in price, income and price of related goods causes people to demand a lot more or a lot less of the good. In this lesson we will emphaaize on nature and types of elasticity, methods of measuring different degrees of elasticity etc.

Meaning of Elasticity of Demand

- Elasticity of demand means degree of responsiveness of demand due to change in price, price of related goods, income etc.
- There are three dimensions of elasticity of demand.
a. **Price Elasticity of Demand-** Price elasticity of demand means degree of responsiveness of demand for a commodity to the change in its price.

Price elasticity of demand (e_d) =

$$\frac{\% \ change \ in \ quantity \ demanded}{\% \ change \ in \ price}$$

b. **Income Elasticity of Demand-** Income elasticity of demand refers to the degree of responsiveness of demand for a commodity to the change in income of its buyer.

Income elasticity of demand

$$(e_y) = \frac{\% \ change \ in \ quantity \ demanded}{\% \ change \ in \ income}$$

c. **Cross Elasticity of demand-** Cross elasticity of demand means the degree of responsiveness of demand for a commodity to the change in price of its related goods (substitute goods or complementary goods)
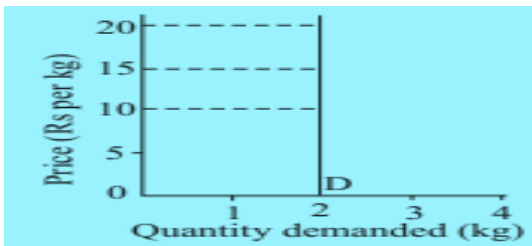
Cross elasticity of demand (e_c) =

$$\frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price\ of\ related\ goods}$$

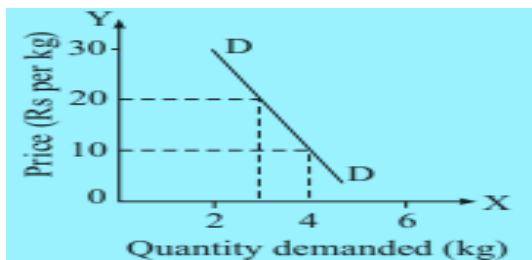# Degrees of Price Elasticity of Demand

Price elasticity of demand is generally classified into following five categories –

- Perfectly inelastic demand (ed) = 0
- Less than unit elastic demand (ed < 1)
- Unit elastic demand (ed = 1)
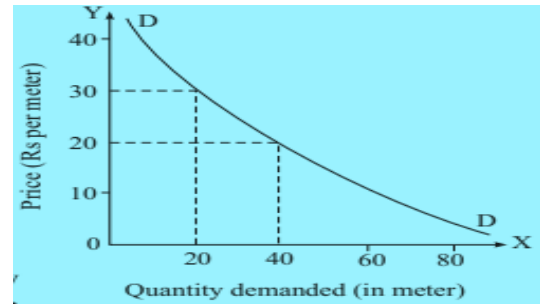- More than unit elastic demand (ed >1)
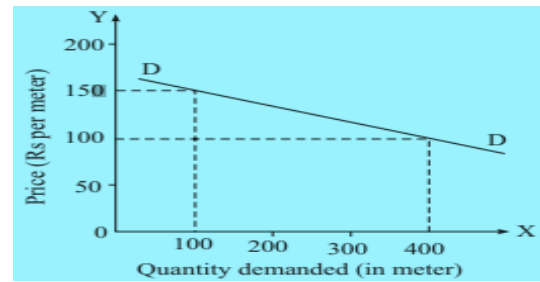- Perfectly elastic demand (ed = ∞

- **Perfectly inelastic demand (ed) = 0**
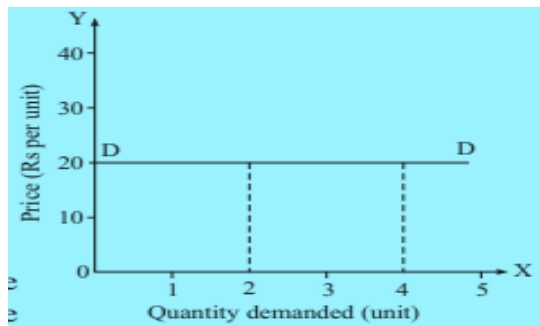

- **Less than unit elastic demand (ed < 1)**

Unit elastic demand (ed = 1)

More than unit elastic demand (ed >1)

Perfectly elastic demand (ed= ∞)

Methods of Measuring Elasticity of Demand

- Percentage or proportionate method.
- Geometric method or Point Method.
- Total Outlay or Expenditure Method.

Percentage or proportionate method.

Price elasticity of demand (e_d) =

$$\frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$$

Percentage change in quantity demanded =

$$\frac{Change\ in\ quantity(\Delta Q)}{Initial\ quantity(Q)} \times 100$$

Percentage change in price =

$$\frac{Change\ in\ price(\Delta P)}{Initial\ initial(P)} \times 100$$

Therefore, $e_d = \dfrac{\frac{\Delta q}{q} \times 100}{\frac{\Delta p}{p} \times 100}$

Where, Δq = Change in Quantity Demanded

q = Original Quantity
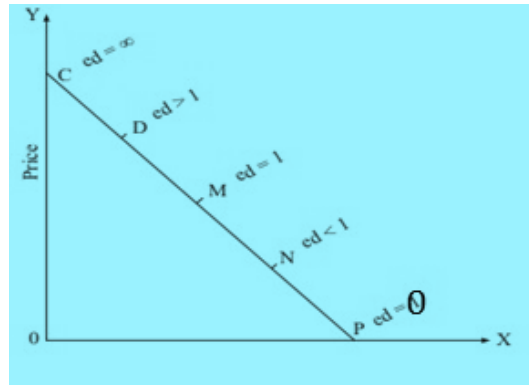
Δp = Change in Price

p = Original Price

Geometric Method or Point Method

- Geometric method is used to measure the elasticity at a point on the straight line demand curve. Elasticity of demand is different at different points on the same straight line demand curve.

$$e_d = \frac{Lower\ segment\ of\ demand\ curve}{Upper\ segment\ of\ demand\ curve}$$

Let us consider a straight line demand curve AB at which elasticity of demand is to be measured at point C, D, M, N, and P.

- E_d at Point M $= \dfrac{MP}{MC} = 1$ Hence MP = MC
- E_d at Point N $= \dfrac{NP}{NC} < 1$
  Point N is below point M so NP is less than NC and elasticity will be less than one.
- E_d at Point P $= \dfrac{0}{PC} = 0$
  Here lower segment is 0.
- E_d at Point D $= \dfrac{DP}{DC} > 1$
  Point D is above point M. So, DP is more than DC. Elasticity at this point will be more than one.
- E_d at Point C $= \dfrac{CP}{0} = \infty$
  Upper segment is 0

Total Outlay or Expenditure Method

- Total outlay method, also known as total expenditure method of measuring price elasticity of demand was developed by Professor Alfred Marshall. According to this method three situation are taken into consideration-
  - (i) Elasticity is less than one $(e_d < 1)$
  - (ii) Elasticity is equal to one$(e_d = 1)$
  - (iii) Elasticity is more than unit elastic $(e_d > 1)$

Elasticity is less than one $(e_d < 1)$

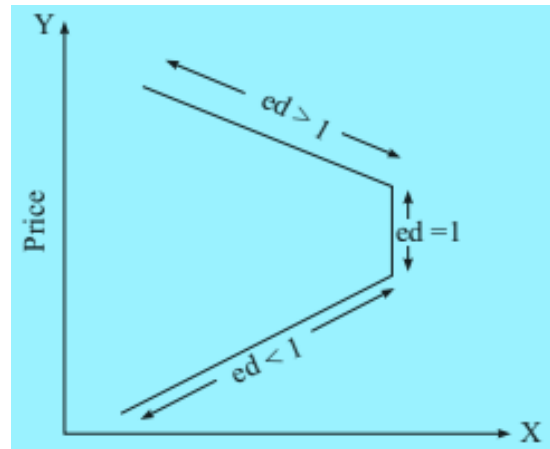| Price Rs. Per Unit	Quantity Demanded(Units)	Total Expenditure (Rs.)
12	10	120
10	11	110

Elasticity is equal to one$(e_d = 1)$

Price Rs. Per Unit	Quantity Demanded(Units)	Total Expenditure (Rs.)
12	10	120
10	12	120

Elasticity is more than unit elastic $(e_d > 1)$

Price Rs. Per Unit	Quantity Demanded(Units)	Total Expenditure (Rs.)
12	10	120
10	14	140

Graphical Presentation

Factors Affecting Elasticity of Demand

Share in Total Expenditure

Availability of Close Substitute

Nature of the Commodity

Level of Price

Level of Income

Habits

Evaluate Yourself

Q. Define Price elasticity, Income Elasticity and Cross Elasticity of demand

Q. When price of a commodity is Rs. 10 per unit, its demand is 100 units. When the price falls to Rs. 8 per unit, demand expands to 150 units. Calculate price elasticity of demand by percentage metho

Q. List out six factors which determine elasticity of demand.

Q. Show different degrees of elasticity on straight line demand curve touching both axis.