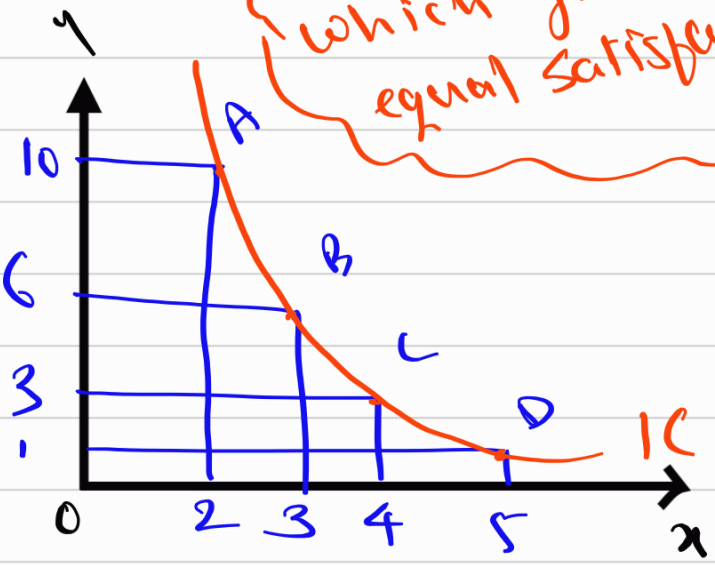
Indifference Curve

AKA Iso-utility curve
(same satisfaction curve)

IC is a locus of diff combinations of 2 commodities which gives equal satisfaction

Set	commodities	
	y	x
A	10	2
B	6	3
C	3	4
D	1	5



Properties of IC

(i) IC is always downward sloping

(ii) IC is always convex to origin, due to ↓ opp. cost / MRS.

(iii) IC's can never intersect each other

(iv) Higher the IC, represents higher level of satisfaction.

(v) IC's can never touch either of Axes.
— it is against assumption of set of commo.

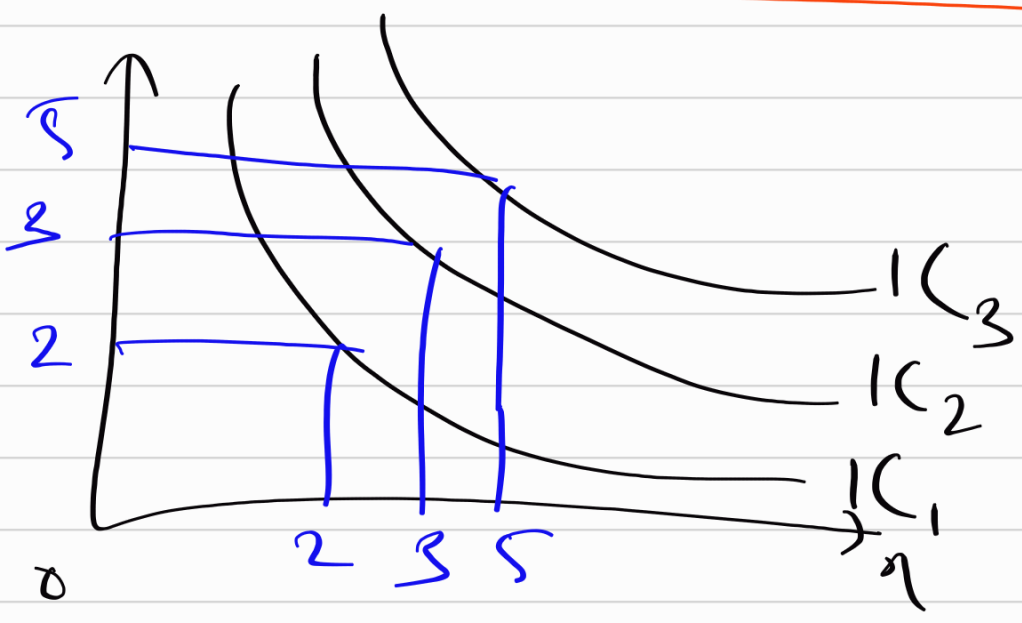
Cardinal utility

Ordinal utility

Possible — Cardinal measurement of utility — ∴ Not possible
∴ Comparison is possible

One commodity — Maximum satisfaction by — set of commodities (atleast 2)

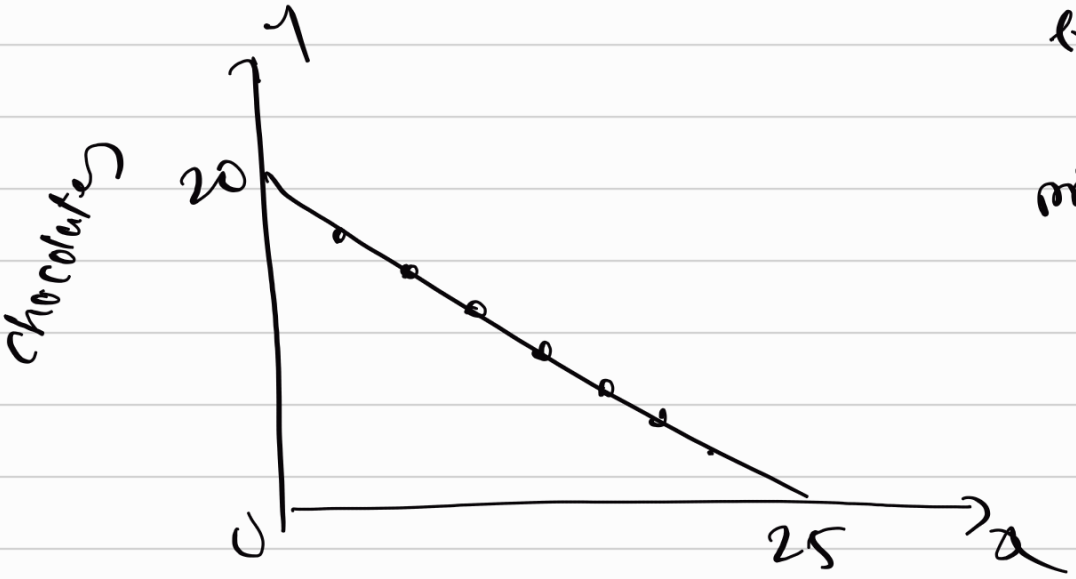
Prof Marshall — Authors — Prof Allen & prof Hicks



IC-map
Set of IC's

Budget-line = shows income of consumer.

AKA price-line.



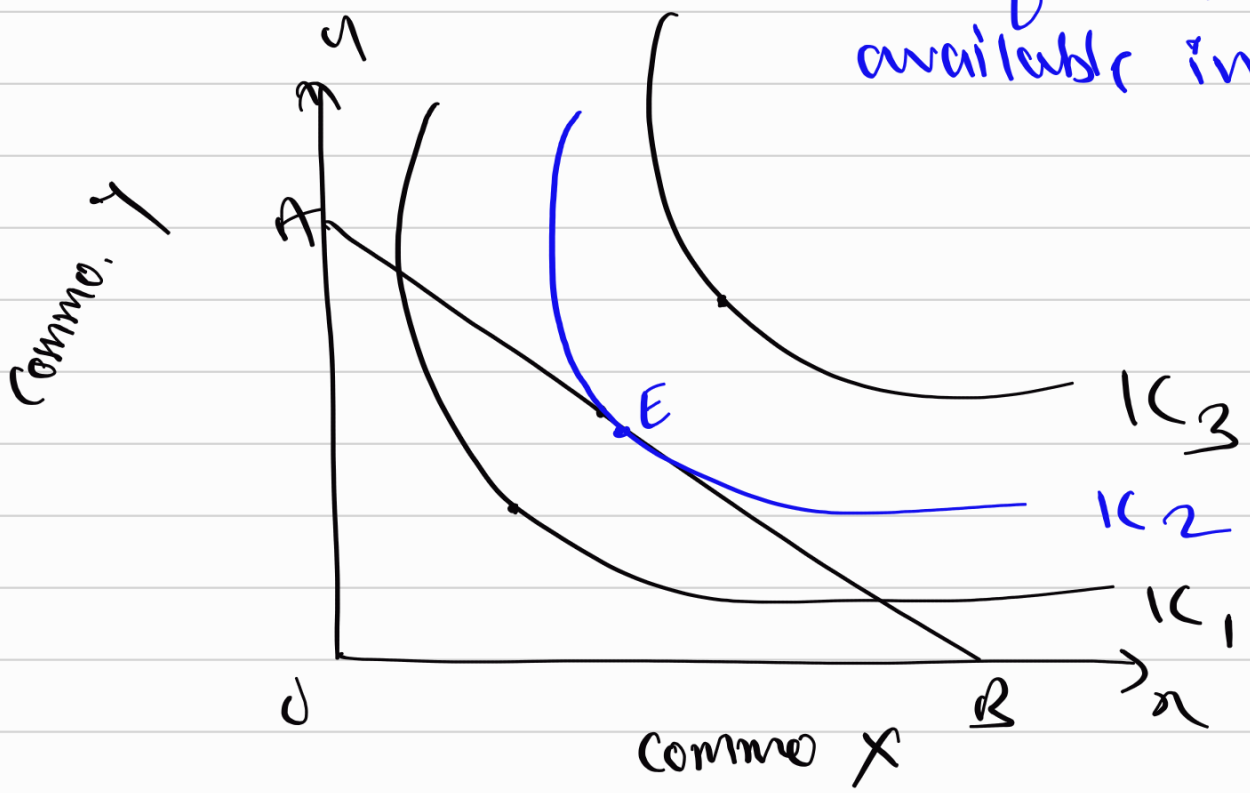
eg income = 500

price ch = $\frac{500}{20} = 25$

Ice = $\frac{500}{25} = 20$

Consumer's Equilibrium

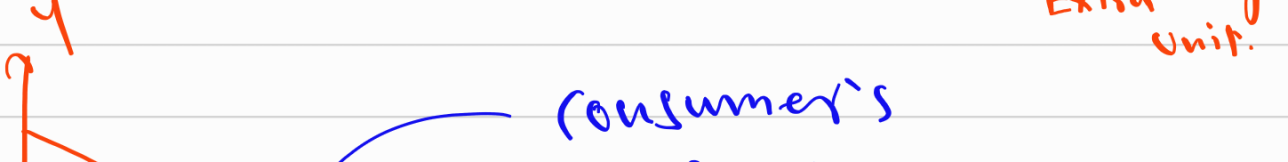
- where IC is tangent to budget line
- it shows maximum satisfaction with available income.



Consumer's Surplus

- It is a Gap between what consumer is willing to pay & what he actually pays.

M Units	MU	Price	MU = ₹1	Cons. Surplus	
1	18	10	18	8	MU > P
2	16	10	16	6	intra marg. unit
3	14	10	14	4	20
4	12	10	12	2	
5	10	10	10	0	MU = P Cons. Eq.
6	8	10	8	-2	MU < P Extra marg. unit.



Utility

– Want satisfying power of commodity.

Features

(i) Subjective concept = Differs from person to person
(ii) Relative concept = (Time & place)
(iii) Different from pleasure, usefulness & satisfaction
(iv) Cardinal measurement is not possible
(v) it is a basis of Demand
(vi) It multipurpose
(vii) Depends upon intensity of want

Types of utility

(i) Form utility :- Utility increases due to change in form of commo.
(ii) place utility :-
(iii) Time utility
(iv) knowledge utility

(v) Possession utility :- Due to change in ownership

(vi) Service utility

Concepts of utility

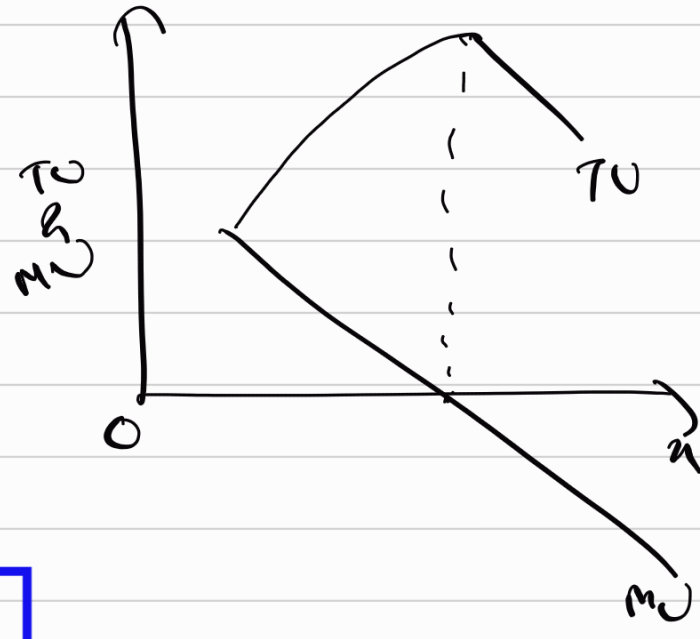
(i) Total utility :- Total satisfaction from all commodities

$TU_n = MU_1 + MU_2 + \dots + MU_n$ or ΣMU.

(ii) Marginal utility :- Additional satisfaction from additional commodity.

$MU = TU_n - TU_{n-1}$

unit	TU	MU
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2



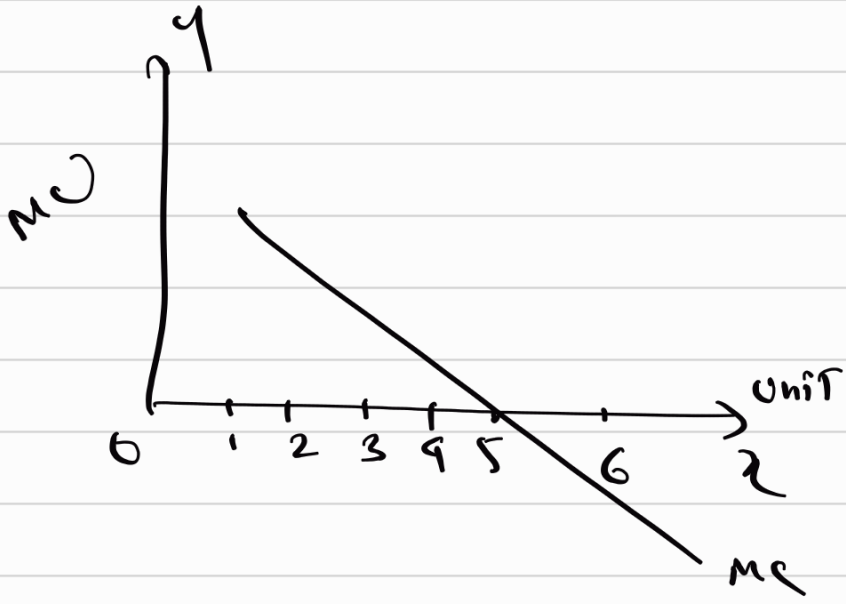
Law of DMU

Intro :- Prof Alfred Marshall, principles of Economics, 1890

Statement :- Other thing being constant,
As stock ↑ ; MU ↓

Unit	MU
1	8
2	6
3	4
4	2
5	0
6	-2

← Point of Satiety



Assumption :-

(i) Cardinal Measurment is possible
(ii) Homogeneity
(iii) Continuity
(iv) Reasonable standard
(v) Rationality.
(vi) Single unit
(vii) Divisibility
(viii) Constant
- price
- income
- Taste & preference

Exceptions → Not Real Exceptions

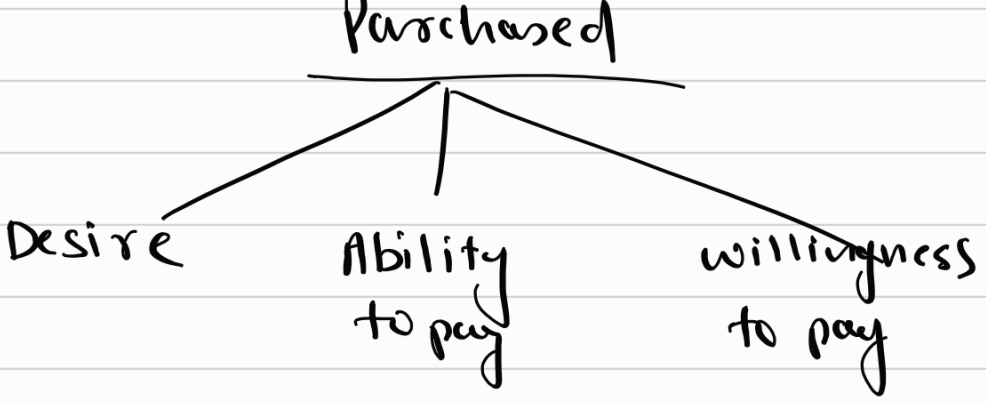
(i) Hobbies
(ii) Addictions
(iii) Misers
(iv) Powers
(v) Money

As Hobbies violates Assumption of Homogeneity & Continuity

Point ii, iii & iv violates Rationality

money violates single unit

Demand



Definition :- Demand is "quantity of goods purchased at certain price, per unit of Time."

Types of Demand :-

(i) Individual Demand
(ii) Market Demand
(iii) Direct Demand
(iv) Indirect / Derived —11—
(v) Composite — multiple wants
(vi) Complementary — Joint Demand
(vii) Competitive — substitutes

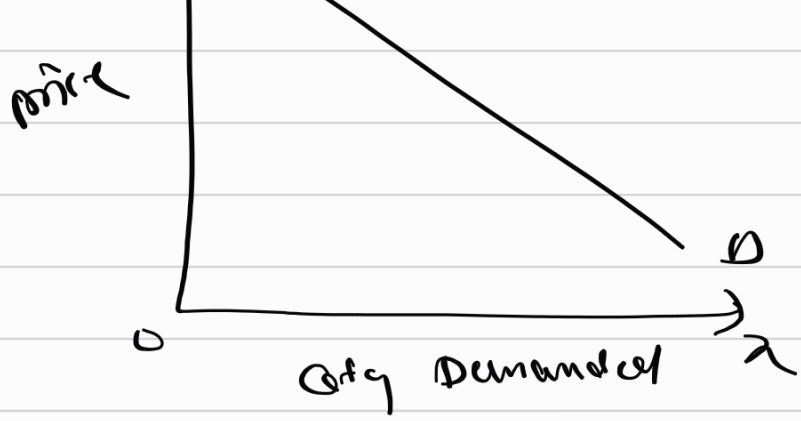
Law of Demand

Intro :- By prof Marshall, principles of Economics, 1890

Statement :- Other things being constant There is an inverse relation between price & Demand

Price Demand

10	50
20	40
30	30
40	20
50	10



Demand (e.g 2000 units per Month)

Gets affected by

- Price
- other factors

Income, Habits, Taste & pref., climate, price of substitutes, price of complementary goods, advertisement, Govt policy

⇓

Assumed to be constant

Assumptions :—

(i) No change in income
(ii) —"— climate
(iii) —"— price of substitutes
& so on.

Exceptions :—

(i) Prestige Goods :-

AKA Snob good, Veblin goods, conspicious goods

P ↑ = Snob appeal ↑ = Rich people Demand ↑

P ↓ = ↓ Demand ↓

(ii) Demonstration effect :-

(iii) Giffen goods

- by Prof Robert giffen
- inferiour goods
- Bread (Inf. Good) & Meat (Sup Good)

Real income (Purchasing Power)

₹100 = 10 Breads

Bread price ₹10

₹5

20 Breads

4 bread ₹20

Meat 60

80

(iv) Speculation = expecting future price

e.g gold = Iam 5000 ↑ Demand ↑

5500 ↑

— Now price ↑ & people are expecting further ↑ in price in future

(v) Habitual goods :-

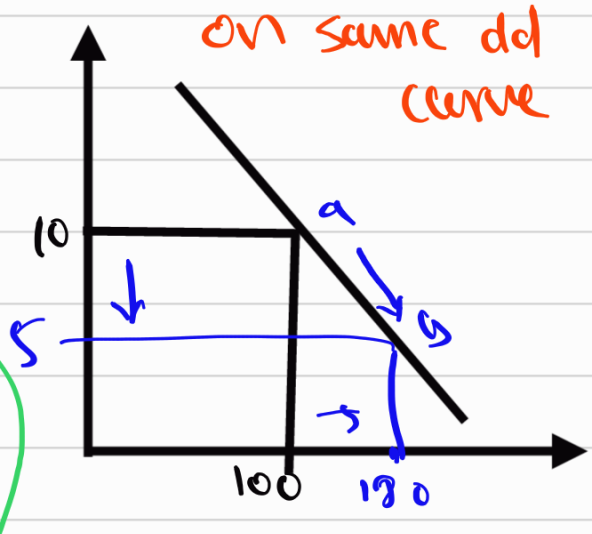
(vi) ignorance :-

VARIATIONS IN DD

Expansion in Demand

Demand ↑ = Price ↓ = QF°

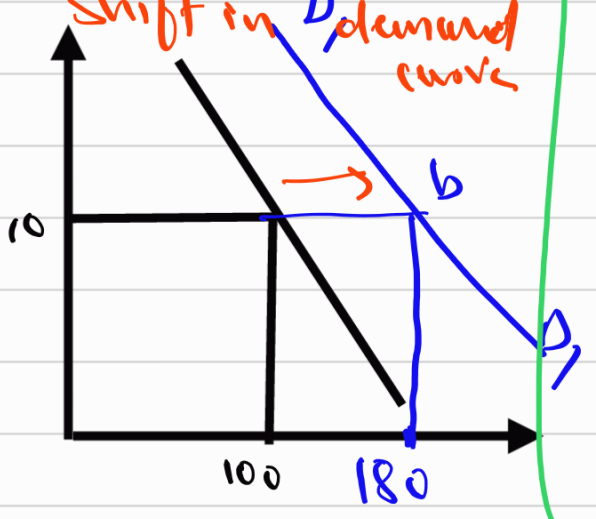
Downward Movement on same dd curve



Increase in Demand

Demand ↑ = other factor = price°

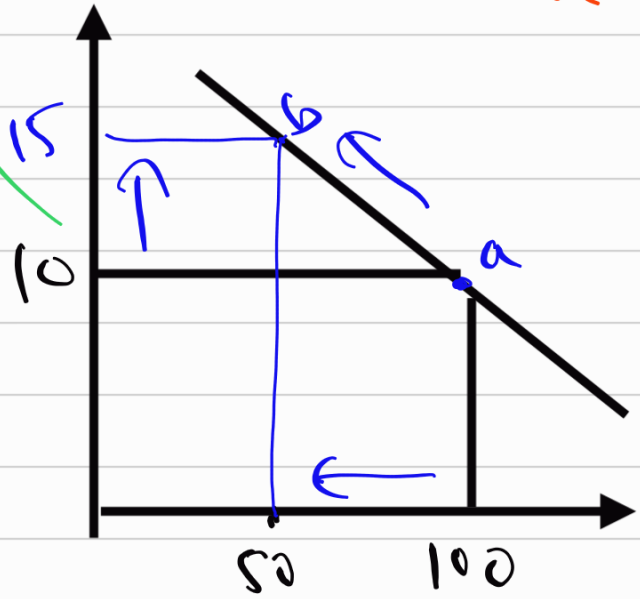
Outward / Rightward Shift in D / demand curve



Contraction in Demand

Demand ↓ = Price ↑ = QF°

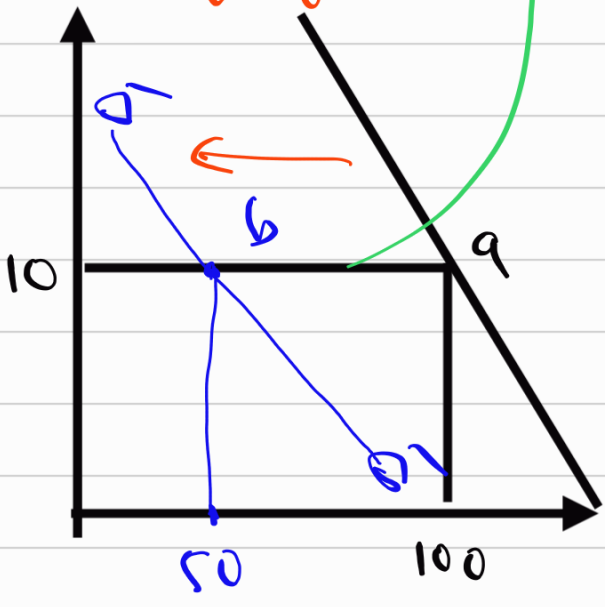
Upward Movement on Same dd curve



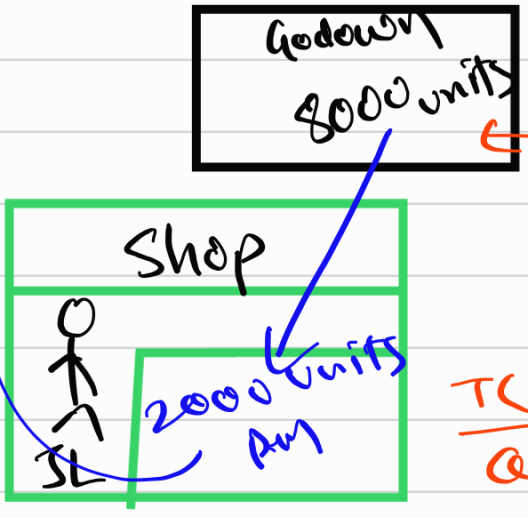
Decrease in Demand

Demand ↓ = QF = P°

Inward / Leftward Shift of dd curve



Change in DD



Stock

Ready to sell
↓↓
Supply.

Market
SP = 180 ✓
Supply = 2000 units
PM

TC ₹800.000
AC = 8000 = 100

Cost P.u (AC) = 100
Min. profit = 40
Min SP = 140

Reservation price

Important concepts :-

(i) Stock = Quantity of goods available with seller at given point of time

(ii) Reservation price = Min. Selling price, below which seller refuse to sell.

(iii) Supply :- Quantity of goods, which seller is ready to sell (Able & willing to sell) at certain price, per unit of time.

Factors affecting Supply

Supply ↑

Affected by

price

other factors

(i) Cost of production

cost ↓ = profit ↑ = SS ↑ & Vice Versa

(ii) Technology.

(iii) Infrastructure = Facilities.

(iv) Climate

(v) Govt policies

(vi) price of other good

	X Good concern	Y other good
P_1	100	100
P_2	100	140
SS	SS ↓	SS ↑

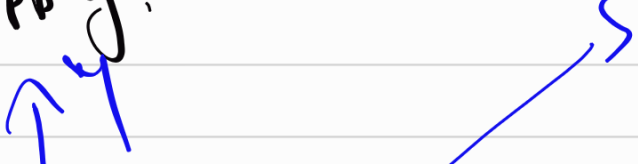
(vi) Speculation

Law of Supply

Intro = Prof Alfred Marshall, Principles of ECO, 1890

Statement = other things beings equal,
There is direct relationship between price & Supply.

Price Supply



10	20
20	40
30	60
40	80
50	100

Assumption = All other factors are assumed to be constant

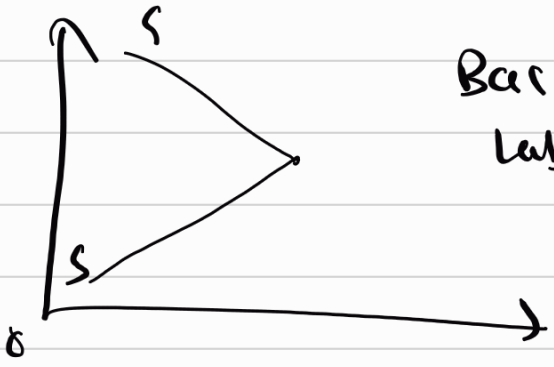
Cost = 100
Profit = 40
SP = 140
SS = 2000 units

100
10
150 ↑
SS ↑

Exceptions :-

(i) Labour Supply :-

Initially wages ↑ = Labour Supply ↑
Beyond certain wages ↑ = Lab Supply ↓ = Leisure ↑

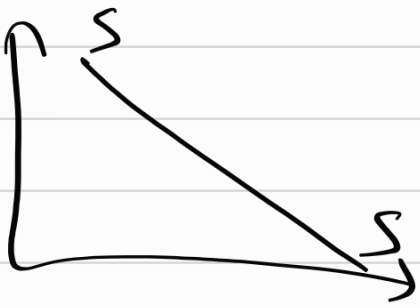


Backward bending Lab Supply curve

(ii) Urgency for cash

e.g £1000

Price	SS
↑ 10	1000 ↓
20	500

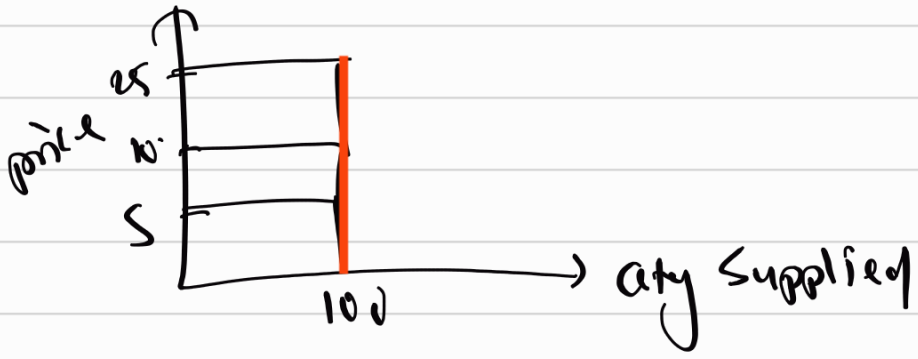


(iii) Rare Article :- e.g Antiques, vintage car

(iv) Agricultural goods = SS depends upon climate

(v) perishable goods :- e.g flowers

Stock = 100 units



(vi) Speculation :-

Price ↓ from 1000 to 900

but seller expects further ↓ in future = SS ↑

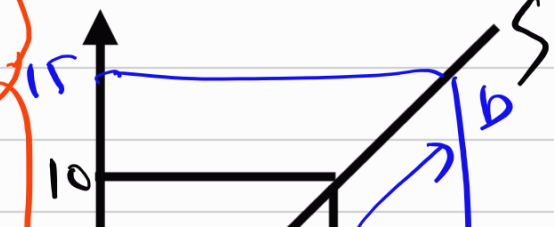
VARIATION

Expansion in Supply

Supply ↑ = price ↑

other factors °

upward movement on same supply curve

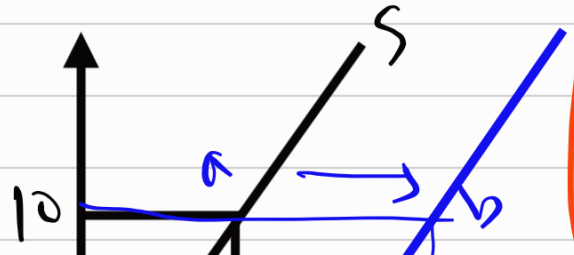


Increase in Supply

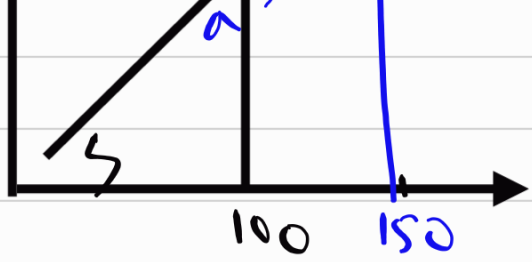
Supply ↑ = other factors

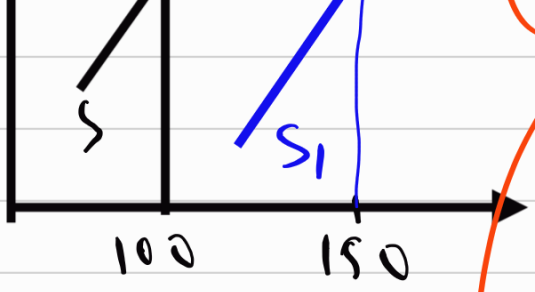
price °

Outward/Rightward shift of SS curve



CHANGE





Contraction in Supply

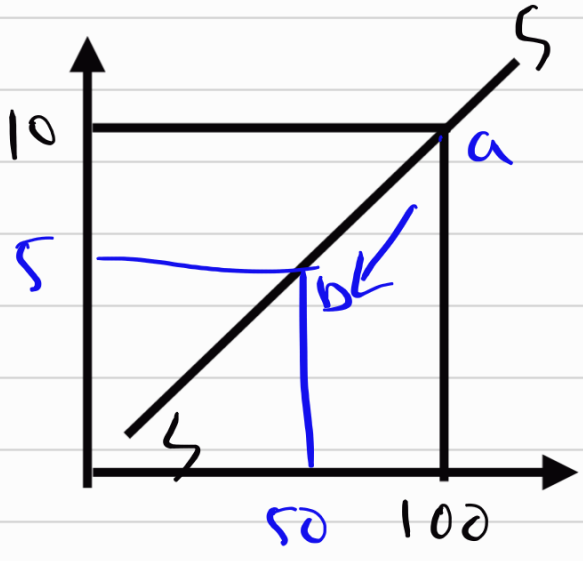
Supply ↓ = price ↑ other factors°

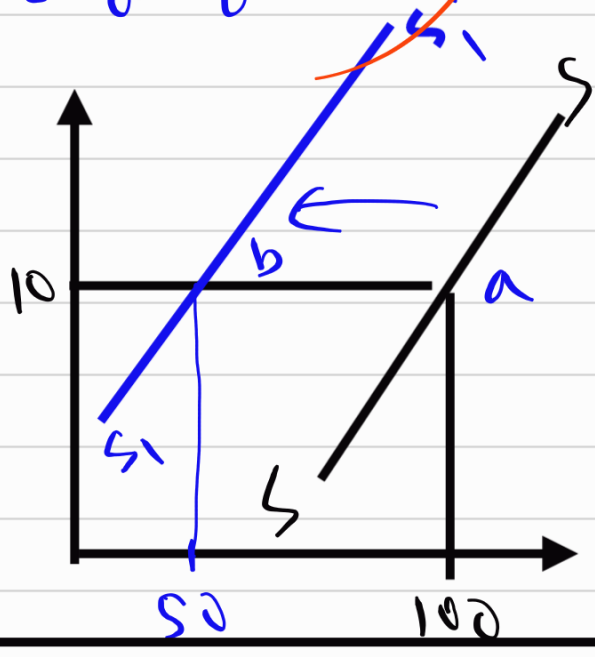
Downward movement on same SS curve

Decrease in Supply

Supply ↓ = other factors = price°

Inward/Leftward shift of SS curve





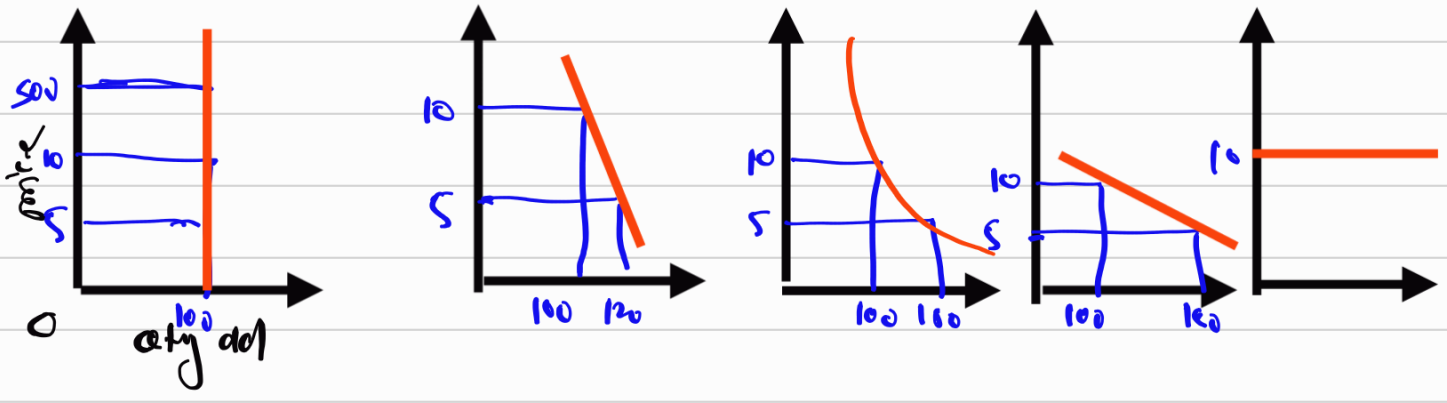
EOD → Degree of responsiveness of demand, to change in

- price → PED
- income → YED
- Price of other Goods → CED

Types of Price elasticity of Demand

Degree of responsiveness of Demand to change in price.

	Perfectly inelastic	Relatively inelastic	Unitary elastic	Relatively elastic	Perfectly elastic
$P_1=10$ ↓ $P_2=5$	$Q_1=100$, $Q_2=100$	$Q_1=100$, $Q_2=120$	$Q_1=100$, $Q_2=150$	$Q_1=100$, $Q_2=180$	$P_1=10$ $Q_1=100$, $P_2=10$ $Q_2=\infty$ or 935
(50%)	(0%)	(20%)	(50%)	(80%)	(∞)
	Salt	Necessary	Comfort	Luxury.	Unreal
	$\Delta Q=0$, $\Delta P=$ Any	$\Delta Q<\Delta P$	$\Delta Q=\Delta P$	$\Delta Q>\Delta P$	$\Delta Q=\infty$ $\Delta P=0$ or slight
$PED=\frac{\%\Delta Q}{\%\Delta P}=$	$\frac{0\%}{50\%}=0$	$=\frac{20\%}{50\%}=0.4$	$=\frac{50\%}{50\%}=1$	$=\frac{80\%}{50\%}=1.6$	$=\frac{\infty}{0}=\infty$
	$e=0$	$e<1$	$e=1$	$e>1$	$e=\infty$
	Vertical	Steeper	Rectangular Hyperbola	Flatter	Horizontal



जहाँ जहाँ Demand वहाँ वहाँ Supply

Types of Price elasticity of Supply

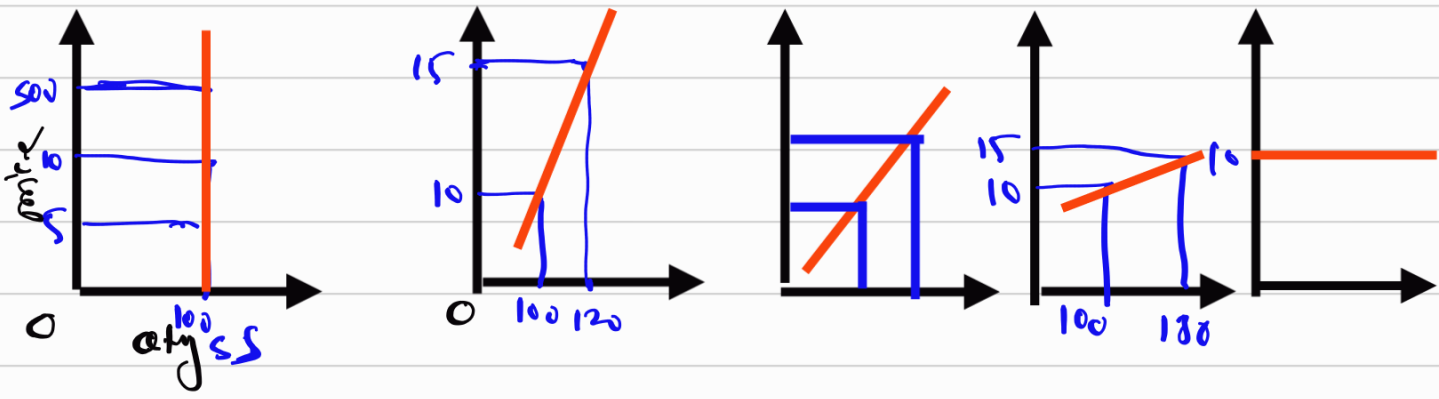
Degree of responsiveness of Supply to change in price.

	Perfectly inelastic	Relatively inelastic	Unitary elastic	Relatively elastic	Perfectly elastic
$P_1=10$ ↑ $P_2=15$	$Q_1=100$, $Q_2=100$	$Q_1=100$, $Q_2=120$	$Q_1=100$, $Q_2=150$	$Q_1=100$, $Q_2=180$	$P_1=10$ $Q_1=100$, $P_2=10$ $Q_2=\infty$ or 935
(50%)	(0%)	(20%)	(50%)	(80%)	(∞)
	Salt	Necessary	Comfort	Luxury.	Unreal

$\Delta Qs = 0, \Delta P = Any$ | $\Delta Qs < \Delta P$ | $\Delta Qs = \Delta P$ | $\Delta Qs > \Delta P$ | $\Delta Qs = \infty$ $\Delta P = 0$ or slight

$PES = \frac{\%\Delta Qs}{\%\Delta P}$ = $\frac{0\%}{50\%} = 0$ | $= \frac{20\%}{50\%} = 0.4$ | $= \frac{50\%}{50\%} = 1$ | $= \frac{80\%}{50\%} = 1.6$ | $= \frac{\infty}{0} = \infty$

$e = 0$	$e < 1$	$e = 1$	$e > 1$	$e = \infty$
Vertical	Steeper	Rectangular Hyperbola	Flatter	Horizontal



जहाँ जहाँ Price वहाँ वहाँ Income

Types of Income elasticity of Demand

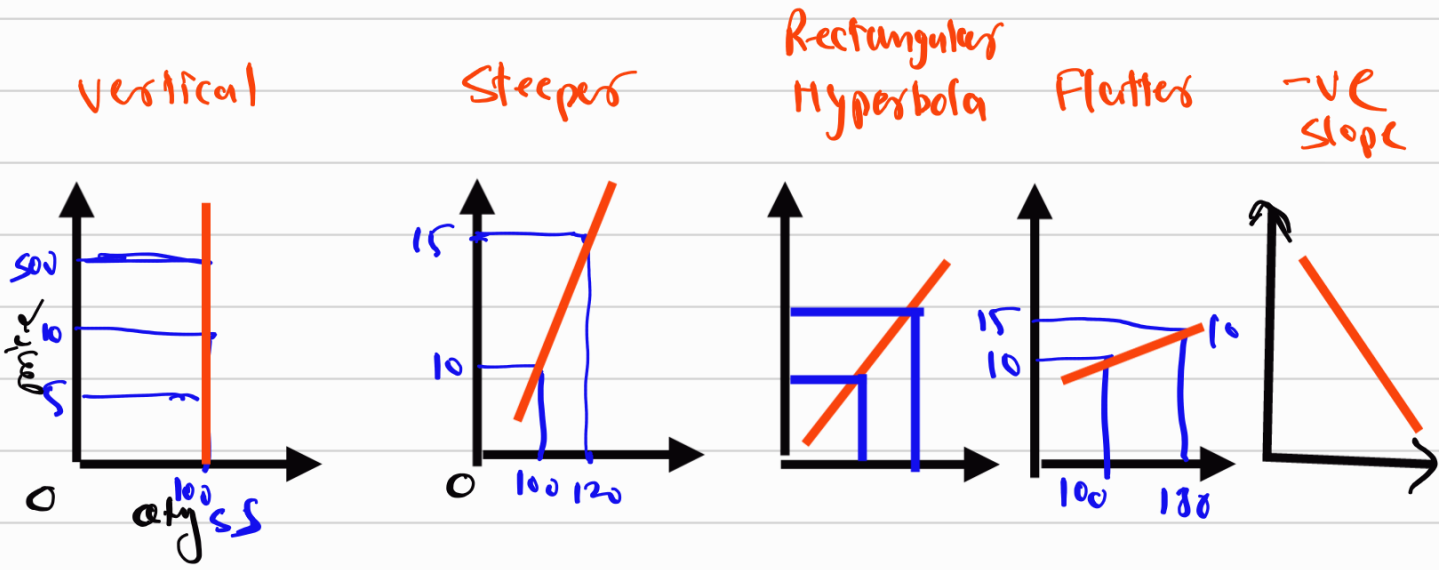
Degree of responsiveness of Demand to change in Income

	Zero YED	Rel Income Inelastic	Unitary Income elastic	Rel Income elastic	Negative YED
$Y_1 = 10$ ↑ $Y_2 = 15$	$Q_1 = 100$	$Q_1 = 100$	$Q_1 = 100$	$Q_1 = 100$	$Q_1 = 100$
(50%)	$Q_2 = 100$ (0%)	$Q_2 = 120$ (20%)	$Q_2 = 150$ (50%)	$Q_2 = 180$ (80%)	$Q_2 = 80$ (-20%)
	Salt	Necessary	Comfort	Luxury.	Inferior
	$\Delta Q = 0, \Delta Y = Any$	$\Delta Q < \Delta Y$	$\Delta Q = \Delta Y$	$\Delta Q > \Delta Y$	Y↑ Q↓

$YED = \frac{\%\Delta Q}{\%\Delta Y}$ = $\frac{0\%}{50\%} = 0$ | $= \frac{20\%}{50\%} = 0.4$ | $= \frac{50\%}{50\%} = 1$ | $= \frac{80\%}{50\%} = 1.6$ | $= \frac{-20\%}{50\%}$

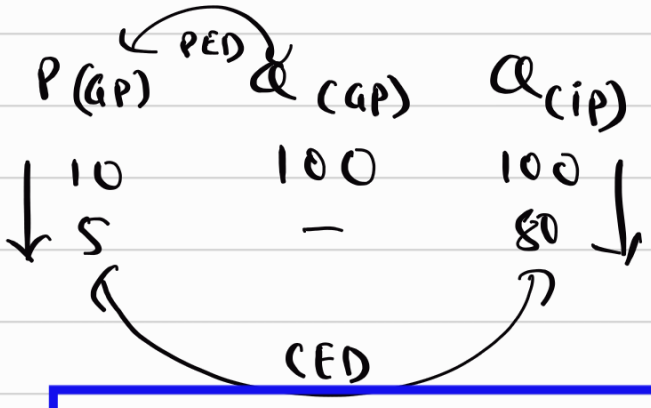
$e = 0$	$e < 1$	$e = 1$	$e > 1$	$e = -ve$

Vertical Steeper Rectangular Hyperbola Flatter -ve slope



Cross elasticity of Demand

Degree of responsiveness of demand to change in price of other goods.



$$CED = \frac{\%\ \Delta Q \text{ Good concern}}{\%\ \Delta P \text{ other good}}$$

Positive CED

OG — Pepsi — coke — GC

	Pepsi	coke
P_1	10	10
Q_1	100	100
P_2	12	
Q_2		120

Negative CED

OG — cars — petrol — GC

	cars	petrol
P_1	10L	£100
Q_1	100	200
P_2	12L	
Q_2		150

Zero CED

	pepsi	petrol
P_1	10	100
Q_1	100	100
P_2	12	
Q_2		100

P_2	12	10		P_2	8L	₹100		P_2	12	100
Q_2	–	140		Q_2	–	280		Q_2	–	100

$$CED = \frac{40\%}{20\%} = 2$$

e.g Substitutes

$$CED = \frac{40\%}{-20\%} = -2$$

e.g Complementary

$$CED = \frac{0\%}{} = 0$$

eg Unrelated goods

Methods of Calucating PED

(i) % method

- AKA Proportionate method & Ratio method
- intro by Prof Alfred Marshall.
- $$PED = \frac{\%\ \Delta Q}{\%\ \Delta P}$$

$$PED = \frac{\frac{Q_1 - Q_2}{Q_1} \times 100}{\frac{P_1 - P_2}{P_1} \times 100}$$

$$PED = \frac{Q_1 - Q_2}{Q_1} \times \frac{P_1}{P_1 - P_2}$$

e.g $P_1 = 90 \quad Q_1 = 180$
$P_2 = 240 \quad Q_2 = 60$

Ped ?

$$PED = \frac{+120}{} \times \frac{90}{} = \frac{4}{} = 0.4$$

$\frac{160}{2}$ $\frac{150}{5}$ 10

since $e < 1$ it is inelastic dd.

(ii) Arc Method

$$PED = \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_1 - P_2}$$

$$PED = \frac{120}{240} \times \frac{330}{150} = \frac{33}{30} = 1.1$$

(iii) Total Expenditure method

AKA Total Outlay method
& Total Revenue method

- TE = Price x Qty purchased
  TR = price x Qty Sold
  } TO = P x Q

- intro by Prof Marshall.

Price	Demand	TO	Relation	
10 ↑	60	600 ↑	Direct	Inelastic PED < 1
20 ↑	50	1000 ↑		
30 ↑	40	1200	No Δ in T.O.	Unitary PED = 1
40 ↑	30	1200		

e.g petrol

P	Q	TO
60	30	1800
100	25	2500

e.g Necessary

P	Q	TO
60	30	1800
100	18	1800

e.g Comfort

50 ↑ 20 1000 ↓ inverse relation

60 ↑ 10 600 ↓

Elastic PED > 1

P	Q	TO
60	30	1800
100	10	1000 ↓

e.g luxury.

Q1 No matter what the price is; Arjun always spends ₹50 on coffee. ✓ dd for coffee is _____

ΔP, lead No change in < Qty = Perf. inelastic ✓
Revenue / exp = Unitary elastic

Q2 Theatre manager wants to ↑ movie ticket & he is expecting ↑ TR; Acc. to him demand for movie ticket is inelastic

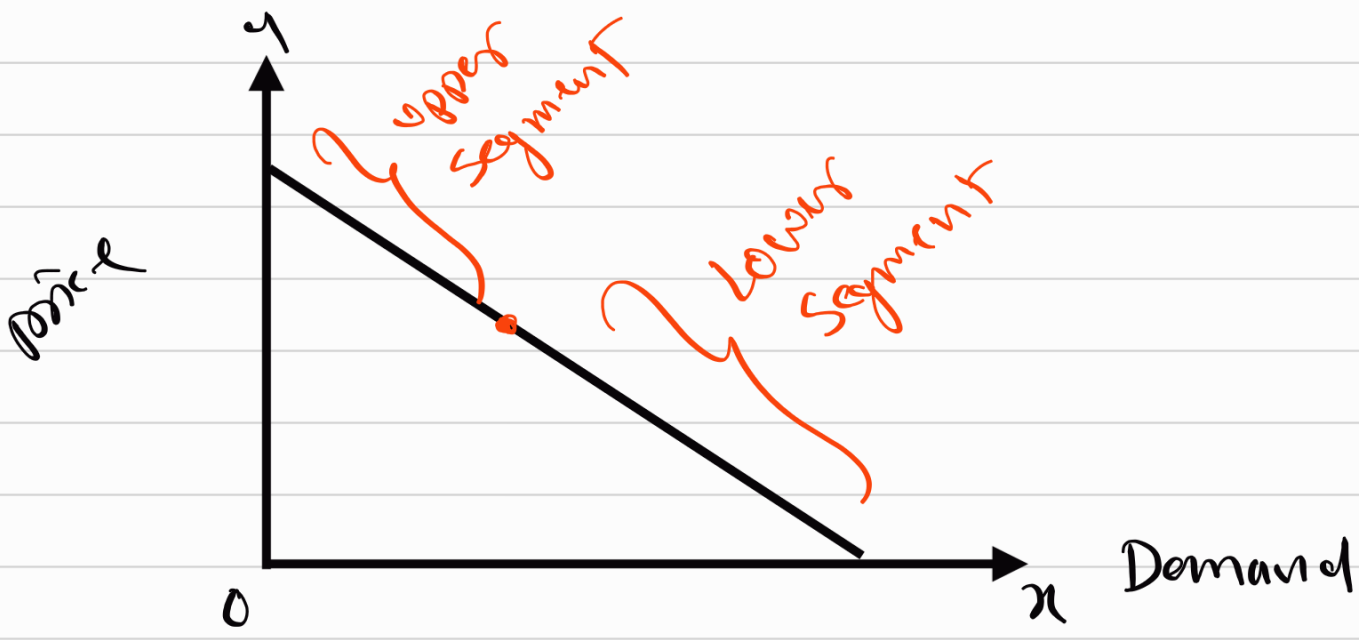
✓ (a) inelastic (b) elastic (c) unit elastic

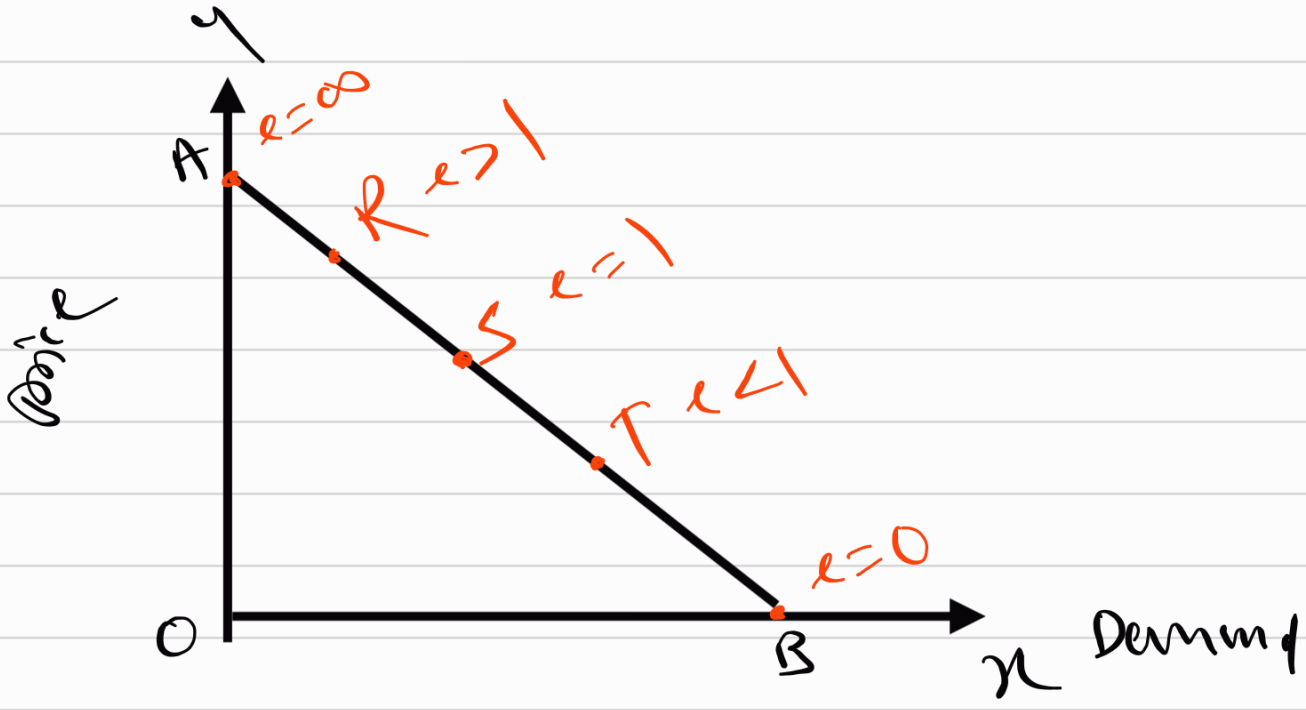
Q3 Expert advised company to ↓ price, to ↑ TR Acc. to him dd for co's prod is elastic

(iv) Geometric Method
AKA Point Method.

— intro Prof Marshall

— $$PED = \frac{\text{Lower Segment}}{\text{Upper Segment}}$$

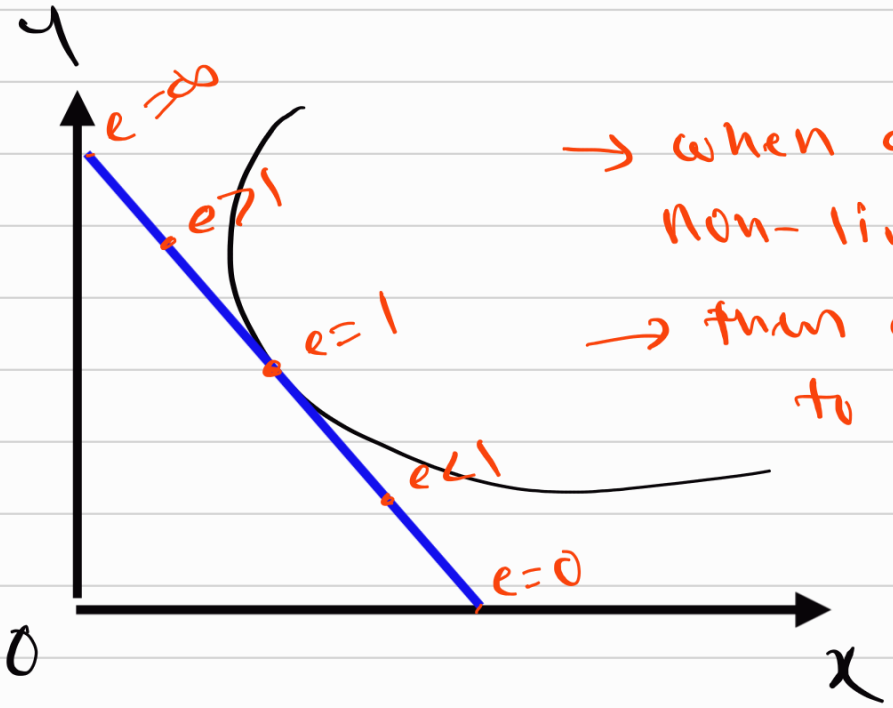




At

S	$\frac{SB}{SA}$	SB = SA	$\therefore e = 1$	unitary elastic
T	$\frac{TB}{TA}$	TB < TA	$e < 1$	inelastic
R	$\frac{RB}{RA}$	RB > RA	$e > 1$	elastic
A	$\frac{AB}{O}$		$e = \infty$	Perf elastic

$\frac{0}{AB}$ $e=0$ Perf inelastic



→ when dd curve is non-linear

→ then draw tangent to get PED

(v) Point Method

– when change in dd is Negligible

PED

$$ed = \frac{-dq}{dp} \times \frac{p}{q}$$

$Q_1 = 10 \quad P_1 = 6$
$Q_2 = 15 \quad P_2 = 4$

$$ed = \frac{-\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

$$= \frac{-5}{2} \times \frac{6}{10} = \frac{-3}{2} = -1.5$$

PES

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

$Q = -100 + 10P$ where $P = 15$

PES = ?

(i) $Q = -100 + 10(15) = 50$

(ii) $\frac{dq}{dp} = -100 + 10P'$

$= 0 + 10 \times 1 = 10$

(iii) $Es = \frac{dq}{dp} \times \frac{p}{q}$

$= 10 \times \frac{15}{50}$

$= \frac{150}{50} = 3$

Determinants of PED (Factors affecting PED)

if ΔQ = more = Elastic

ΔQ = less = inelastic

(i) Nature of commodity

- Necessary ⇓ inelastic
- luxury ⇓ elastic

(ii) Income level of consumer

- High ⇓ inelastic
- Low ⇓ elastic

(iii) Proportion of income Spent

- Small ⇓ inelastic
- Large ⇓ elastic

(iv) Level of price of commodity

High priced = Diamonds etc
&
Low priced = Match box, pin etc
} = inelastic

(v) Availability of Substitutes

No / Few → inelastic

many → elastic

(vi) Complementary Goods = inelastic

(vii) Habit / Customs = Inelastic

(viii) Time factor

- Short Run ⇓ Inelastic
- Long Run ⇓ elastic

(ix) Durability

- Perishable ⇓ inelastic
- Durable ⇓ elastic

(x) Urgently required = inelastic

(xi) No. of uses

- Single → inelastic
- multiple use → elastic

Methods of Calculating PES

(i) % method = $PES = \frac{\% \Delta Q}{\% \Delta P}$ or $\frac{Q_1 - Q_2}{Q_1} \times \frac{P_1}{P_1 - P_2}$

(ii) Arc method = $PES = \frac{Q_1 - Q_2}{P_1 + P_2} \times \frac{P_1 + P_2}{Q_1 + Q_2}$

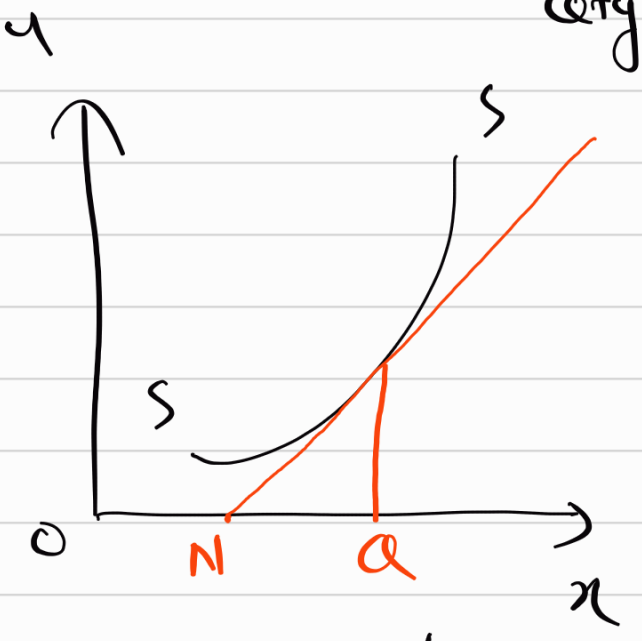
(ii) Arc method = $\frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_1 - P_2}$

(iii) Total revenue method

(iv) point method

(v) Geometric method

$$PES = \frac{\text{Tangent curve intercept on x axis to perpendicular point}}{\text{Qty Supplied}}$$

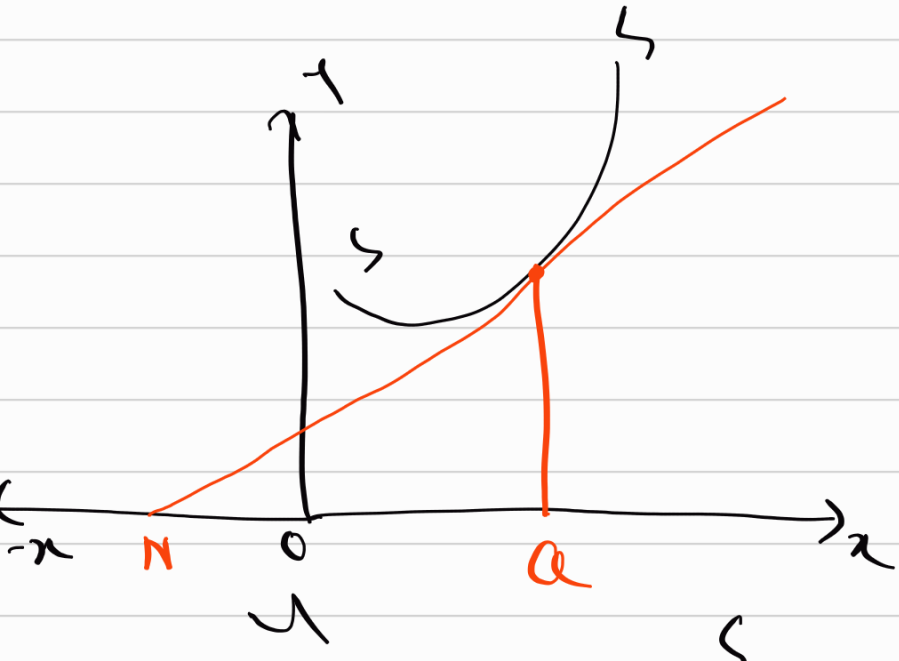


$$PES = \frac{NQ}{OQ}$$

$NQ < OQ$

$PES < 1$

$\therefore$ inelastic Supply.

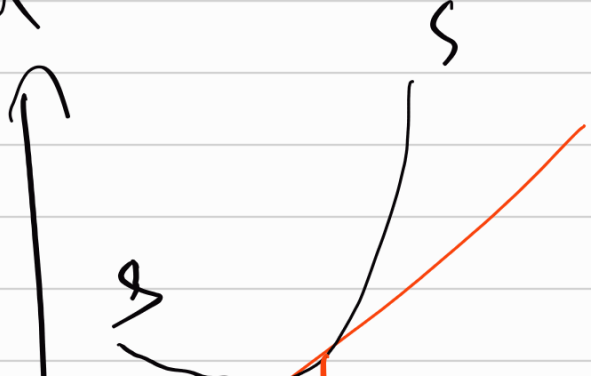


$$PES = \frac{NQ}{OQ}$$

$NQ > OQ$

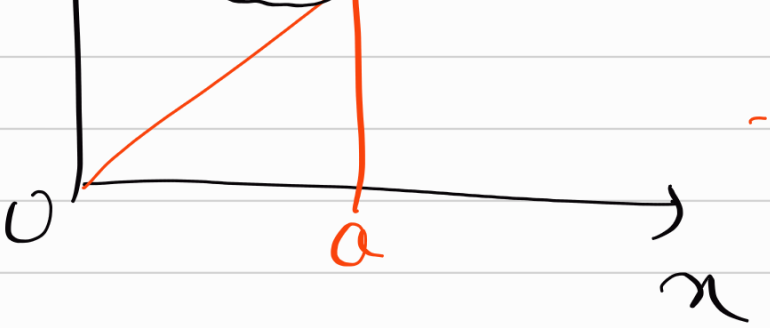
$PES > 1$

$\therefore$ elastic SS.



$$PES = \frac{OQ}{OQ}$$

$= 1$



$\therefore$ Unitary elastic

SS

Factors affecting PES

(i) Nature of commodity

- Perishable → Perfectly inelastic
- Durable → elastic

(ii) Cost of Production

- High → inelastic
- Low → elastic

(iii) Climate :- inelastic

(iv) Technique of Production

- Backward / Labour intensive → inelastic
- Advanced / Capital intensive → elastic

(v) Availability of factors

- Easily → elastic
- Scarce → inelastic

(vi) Mobility of factors

Less → inelastic

High → elastic

Demand Forecasting

It refers to predicting demand of product in advance.

Methods of Demand Forecasting

(i) Consumer survey method.
   (a) census / enumerator method
   (b) sample method
   (c) end-use method

(ii) Collective opinion method :- Survey of sales persons.

(iii) Expert opinion method

(iv) Delphi method :- experts are confronted.
   - intro by Adolf Helmer
   - Rand corp. of USA

(v) Statistical method
   (a) regression
   (b) Trend Analysis etc

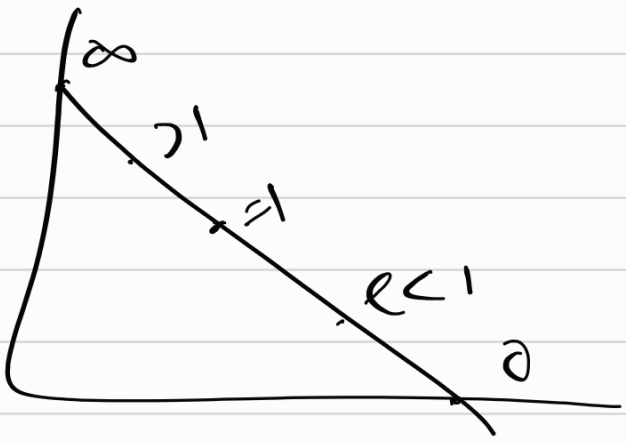
(vi) Market experiment method
   (a) Actual market experiment

(b) Laboratory experiments (consumer clinics)

	Perfect compⁿ	Monopoly	monopolistic compt	Oligopoly
Reality	Unreal	Unreal	Real	Real
No. of Sellers	Many	single	Many	Few
No. of Buyer	Many	Many	Many	Many
Product	Homog.	No close sub.	Differentiated	Hom/Diff
Entry & exit	Free	Restrict	Free	Restrict
Long Run Profit	Normal	Super Norm.	Normal	Super Nor
Price —	Taker	Maker	Seeker	cartel / price-leadership
DD curve	Horizontal	D|W	D|W	Kinked
Elasticity	$e=\infty$	$e<1$	$e>1$	$P\uparrow = e>1$ $P\downarrow = e<1$
collectively	Industry	Firm & industry	Group	—
Price	Lowest	Highest	Lower	Higher
Qty	Highest	Lowest	Higher	Lower
Full use of Resources	✓	✗	✗	✗
Efficient	✓	✗	✗	✗
Excess capacity	Not found	found	found	found

$$\frac{q_1 - q_2}{q_1 + q_2} \times \frac{p_1 + p_{12}}{p_1 - p_2}$$

≥ 1 $\quad$ 0



P↑ = TR↓ = elas

P↓ = TR↓ = inn

P↓ = TR^{0} = uni