ECO 101

Week-1

- Economics : Economics is a social science concerned with the production, distribution and consumption of goods and services.
- Scarcity : It means that the demand for a good or service is greater than the availability of the good or services.
- Normative : Normative economics is a branch of economics that deals with economics fairness and how the economy should be.
- Macroeconomics : It is that part of economic theory which ~~study~~ studies the behaviour of aggregate of the economy as a whole.
- Microeconomics : It is that part of economic theory which studies the behaviour of individual unit of an economy.

- Opperfunity Cost : Opperfunity cost is the value of the next best alternative when the decision is made.

- manginal Benefit : Mangind benefit are the maximum amount a consumerd will pay for an addin additional good ord service.

- Opperfunity cost = $\frac{\text{Sacrifice Product}}{\text{Gain Product.}}$

find Out the Opportunity Cost and draw P.P.F Curve.

	Apple	Grapes
X	30	10
Y	10	30

Opportunity cost of X

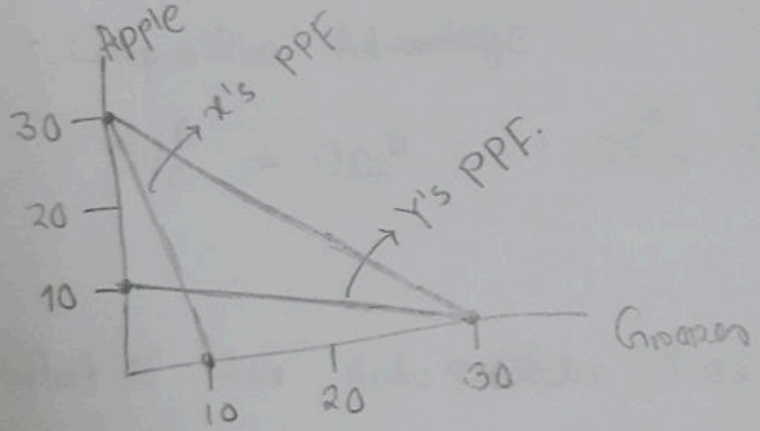
$$OC^{X}_{Apple} = \frac{10}{30} = \frac{1}{3}$$

$$OC^{X}_{Grapes} = \frac{30}{10} = 3$$

Opportunity cost of Y

$$OC^{Y}_{Apple} = \frac{30}{10} = 3$$

$$OC^{Y}_{Grapes} = \frac{10}{30} = \frac{1}{3}$$

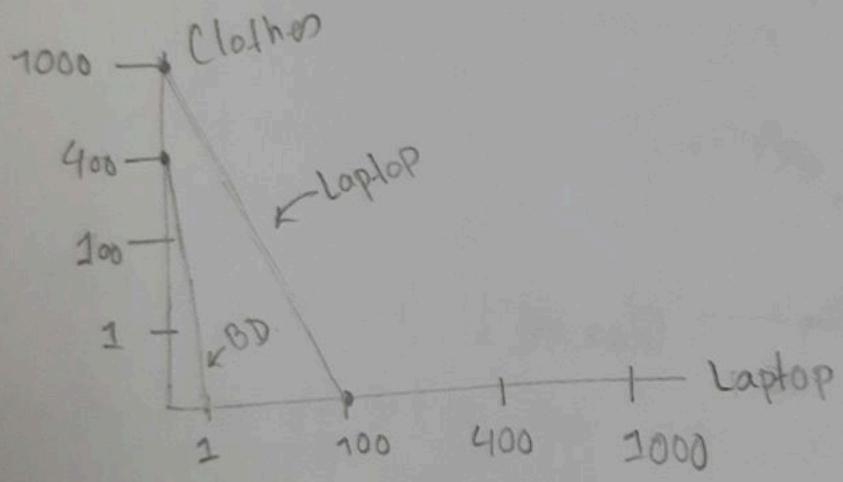


- Find out the Opportunity Cost and Draw P.P.F. Curve

	Clothes	Laptop
US	1000	100
BD	400	1

$$OC^{US}_{Clothes} = \frac{100}{1000} = 0.1 \qquad OC^{BD}_{Clothes} = \frac{1}{400} = 0.0025$$

$$OC^{US}_{Laptop} = \frac{1000}{100} = 10 \qquad OC^{BD}_{Laptop} = \frac{400}{1} = 400$$



	Caps	T-shirt
Country A	3	6
Country B	2	4

- $OC_C^A = ?$; $OC_T^A = ?$
- $OC_C^B = ?$; $OC_T^B = ?$
- Absolute advantage
- Comparitive advantage

$OC_C^A = \frac{6}{3} = 2$; $OC_T^A = \frac{3}{6} = \frac{1}{2}$; $OC_C^B = \frac{4}{2} = 2$; $OC_T^B = \frac{2}{4} = \frac{1}{2}$

- Absolute advantage ~~3+6~~

for A = 3 + 6 = 9
for B = 2 + 4 = 6

| A has ad absolute advantage.

- Comparitive Advantage

$OC_C^A = OC_C^B$ $OC_T^A = OC_T^B$ | No one have Comparitive advantage.

- What if the data will be input.

→ if input data is given. then we have to calculate/figure out the output data. And Rest of the calculation is same as previous.

Exact_Time = 8 hrs

	Caps	T-shirt
Country A	2 hr	4 hr
Country B	1 hr	3 hr

$OC_C^A = ?$ $OC_T^A = ?$

$OC_C^B = ?$ $OC_T^B = ?$

Absolute advantage = ?

Comparitive advantage = ?

step-1: Convert this input table to output.

	Caps	T-shirt
Country A	$\frac{8}{2} = 4$ hr	$\frac{8}{4} = 2$ hr
Country B	$\frac{8}{1} = 8$ hr	$\frac{8}{3} = 2.6$ hr

$OC_C^A = \frac{2}{4} = \frac{1}{2}$; $OC_T^A = \frac{4}{2} = 2$; $OC_C^B = \frac{2.6}{8} = 0.325$

$OC_T^B = \frac{8}{2.6} = 3.0769$

- Absolute advantage

for A = 4 + 2 = 6
for B = 8 + 2.6 = 10.6 | B has Absolute advantage

- Comparitive advantage

$OC_C^A > OC_C^B$ | for Cap, B has Comparitive advantage.

$OC_T^A < OC_T^B$ | for T-shirt, A has Comparitive advantage.

Week - 2.

- Demand : It means willingness and capacity to pay
- Characteristics of Demand
  - → willingness and ability to pay
  - → Demand is always at a price
  - → Demand is always per unit of time.
- Demand Schedule and Demand Curve.

Demand Schedule	Demand Curve
1. It is a tabular presentation of price and Quantity demanded.	1. It is a graphical presentation of the demand schedule.
2. Relationship between price and quantity variations.	2. Relationship between price and quantity demanded
3. Two types of Demand Schedule • Individual Demand Schedule • Market Demand Schedule	3. Two types of Demand Curve • Individual Demand Curve • Maket Demand Curve

· Demand and Quantity Demand

• Demand: It is the quantity that a consumer is willing to purchase at different alternative price.

Example. 'A' buys 4 kg rice at price of 50 also buys 2 liter oil at price of 299 TK.

• Quantity Demand: It is the quantity that a consumer willing to purchas at different alternative price.

Example: 'A' buys 4 kg rice at price of 50 TK.

· Law of Demand: The Law of Demand dictates that when price go up, demand goes down - and when price go down, demand goes up.

$P\uparrow \; Q^d\downarrow$

$P\downarrow \; Q^d\uparrow$.

- Income

Normal Goods: A good whose ~~demand~~ demand increases with an increases in income.

I↑ dd↑.

I↓ dd↓

Inferior Goods: A good whose demand decrease with an increase in income.

I↑ dd↓

I↓ dd↑.

- Prices of Related Goods. [x and y → goods]

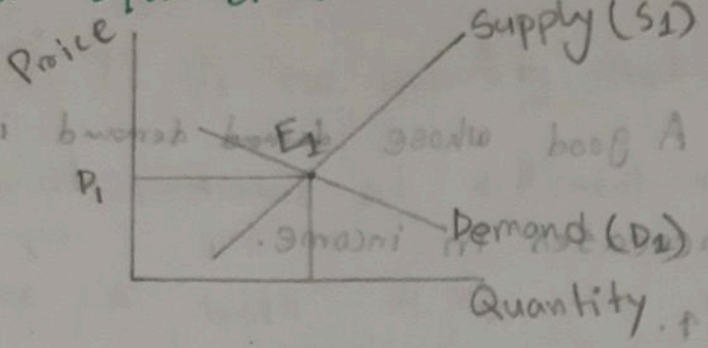
Substitude Goods: P_x↑ Q_x^d↓ dd_y↑

P_x↓ Q_x^d↑ dd_y↓

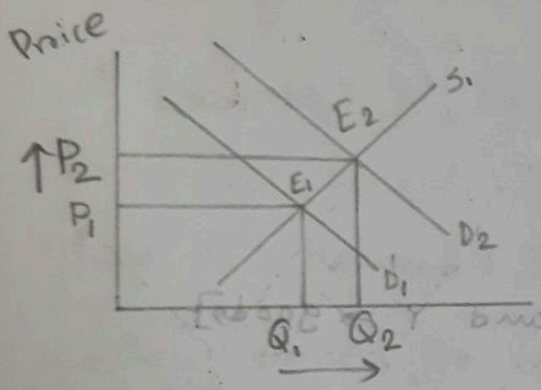
Complementary Goods: P_x↑ Q_x^d↓ dd_y↓

P_x↓ Q_x^d↑ dd_y↑.

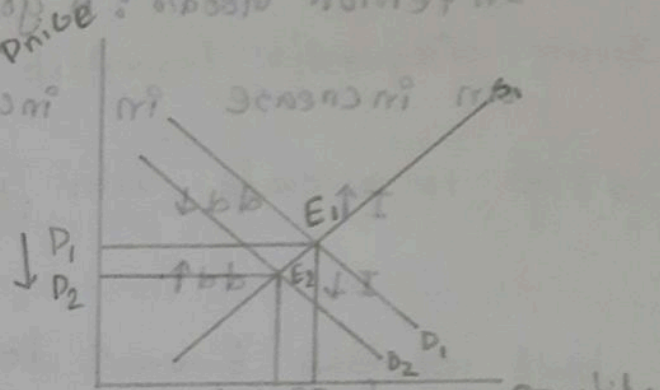
Market Equilibrium



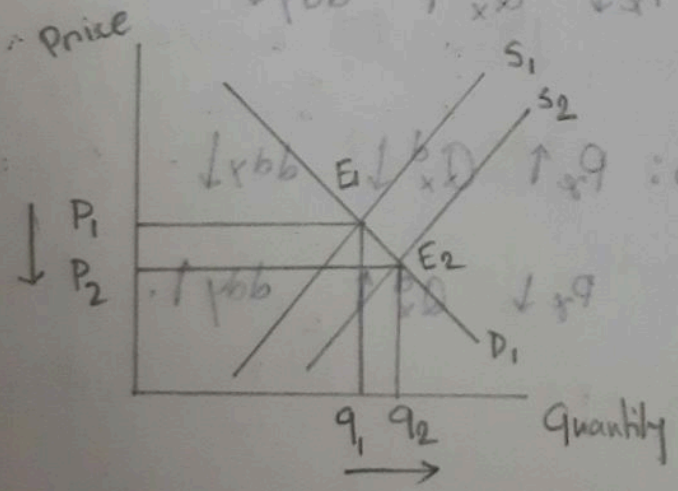
- If demand increase then D_1 moves to the right side
- If demand decrease then D_1 moves to the left side.
- Same as supply also.



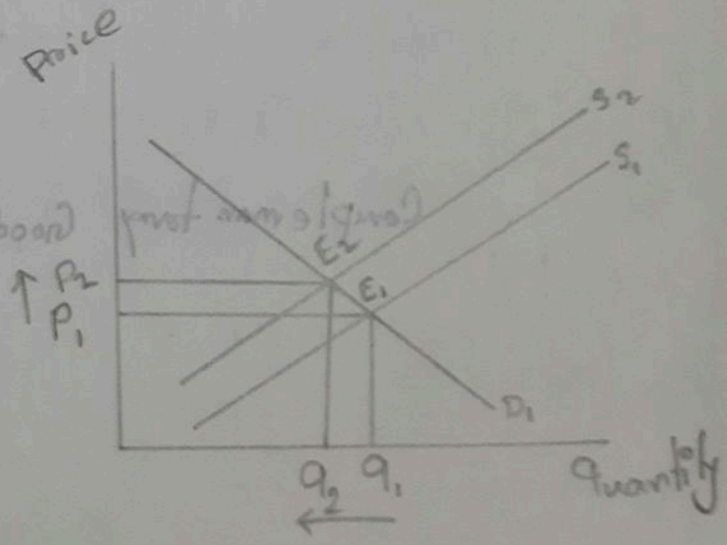
$DD_2\uparrow$: $P\uparrow Q\uparrow$



$DD\downarrow$: $P\downarrow Q\downarrow$



$S\uparrow$: $P\downarrow Q\uparrow$



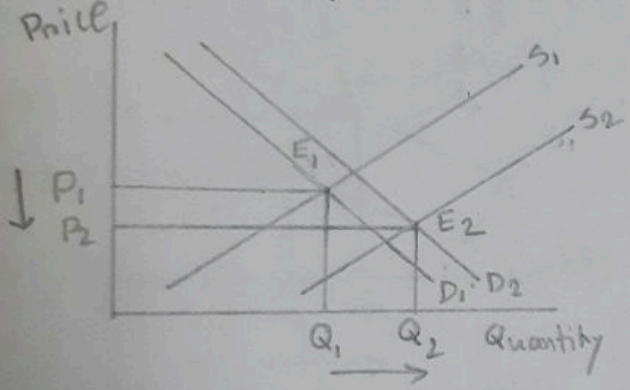
$S\downarrow$: $P\uparrow Q\downarrow$

A change in Both Demand and Supply.

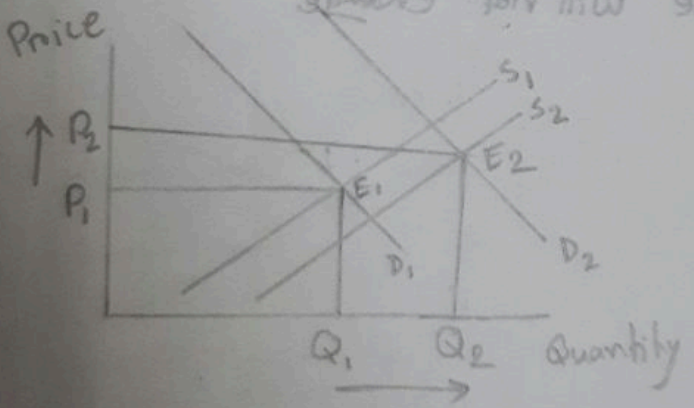
1. Both Demand and Supply increase
2. Both Demand and Supply decrease
3. Demand increases and supply decreases
4. Demand decreases and supply increases.

Both Demand and Supply increases.

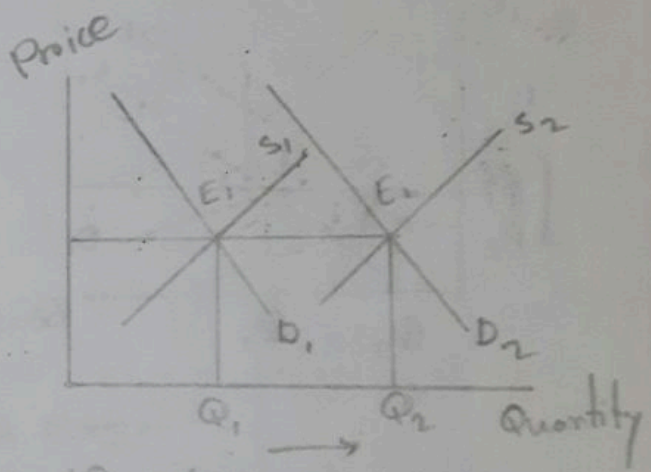
1. DD↑ < SS↑ : P↓ Q↑



2. DD↑ > SS↑ : P↑ Q↑

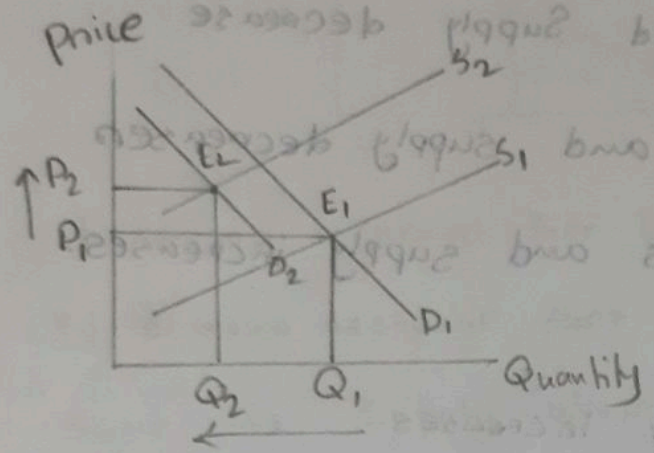


3. DD↑ ≈ SS↑ : Q↑ Price no change

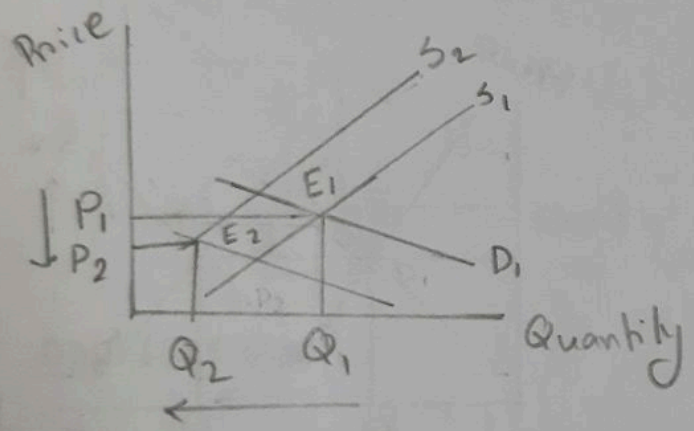


Both Demand and Supply Decrease

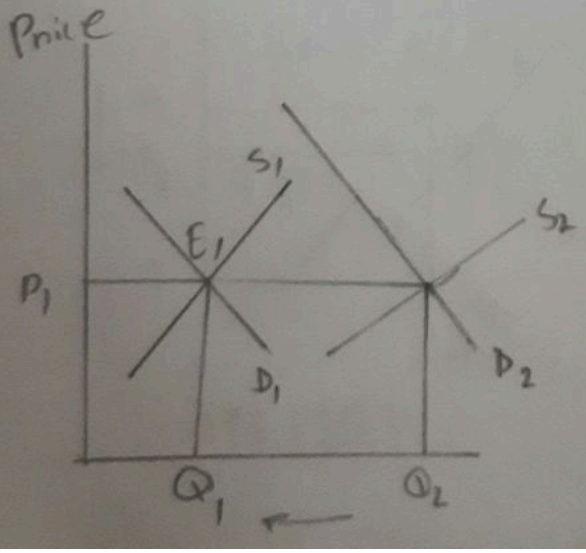
1. DD ↓ < SS ↓ : Q ↓ P ↑



2. DD ↓ > SS ↓ : Q ↓ P ↑

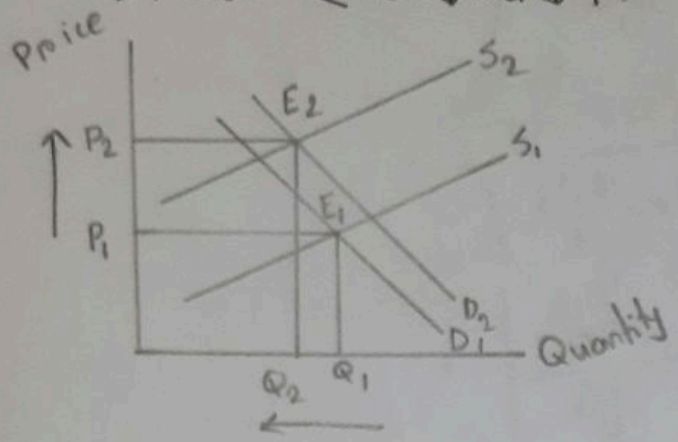


3. DD ↓ ≈ SS ↓ : Q ↓ Price will not change

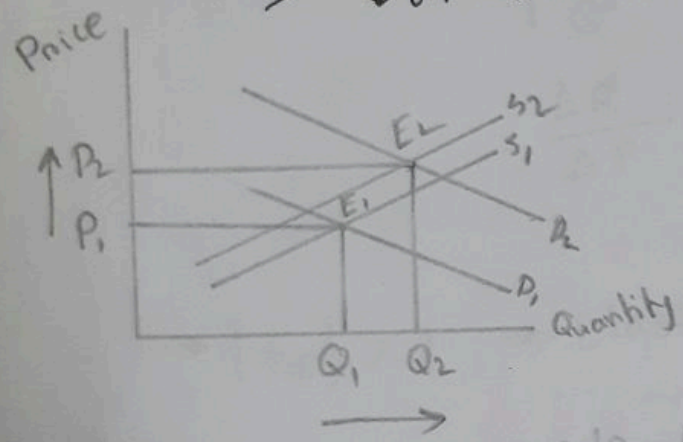


Demand Increases and Supply Decreases

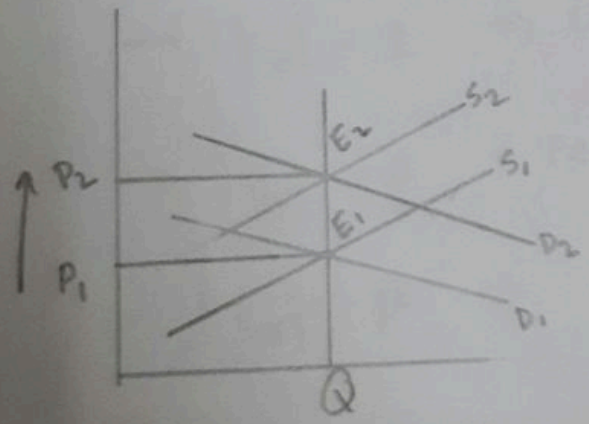
1. DD↑ < SS↓ : Q↓ P↑



2. DD↑ > SS↓ : P↑ Q↑

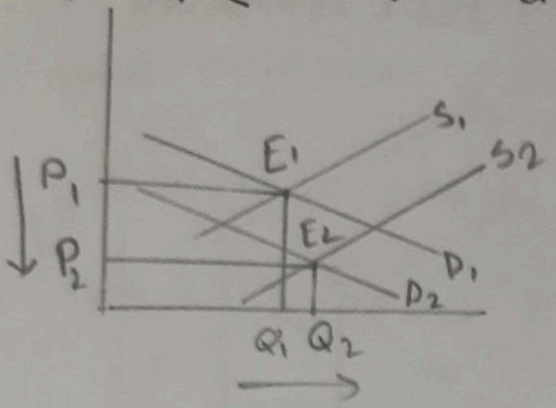


3. DD↑ ≈ SS↓ : P↑ Quantity will not change.

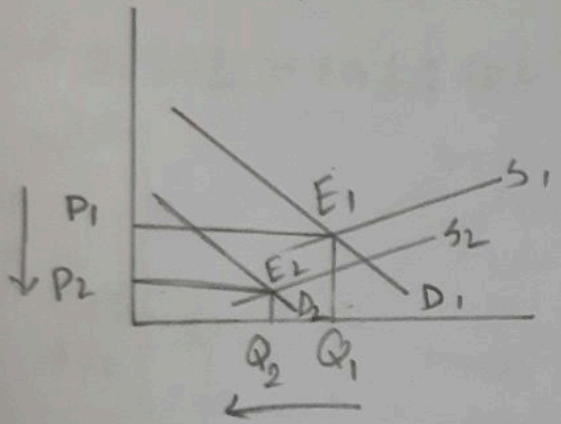


Demand Decreases and Supply Increases.

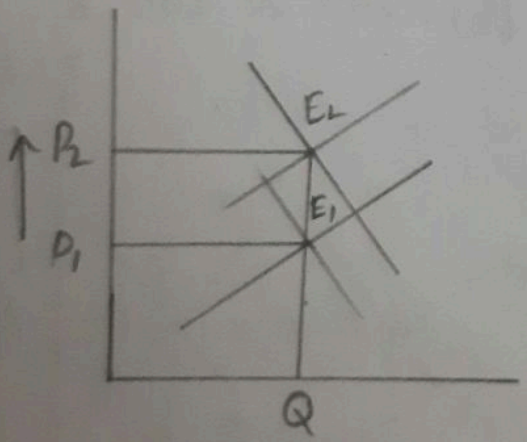
1. DD↓ < SS↑ : P↓ Q↑



2. DD↓ > SS↑ : P↓ Q↓



3. DD↓ ≈ SS↑ : P↑ Q will not change.



Price Elasticity Demand

$$PED = |\varepsilon_d| = \left| \frac{\% \text{ change in } Q^d}{\% \text{ change in } D} \right|$$

$$= \left| \frac{\frac{Q^{d'} - Q^d}{Q^d} \times 100}{\frac{P' - P}{P} \times 100} \right|$$

$$= \left| \frac{\frac{\Delta Q^d}{Q^d}}{\frac{\Delta P}{P}} \right|$$

$$= \left| \frac{\Delta Q^d}{Q^d} \cdot \frac{P}{\Delta P} \right|$$

$$= \frac{\Delta Q^d}{\Delta P} \cdot \frac{P}{Q^d}$$

$\Delta Q = Q' - Q$ (new − old)

$\Delta P = P' - P$ (new − old)

→ $|\varepsilon_d| > 1$ ⇒ Elastic demand [luxary good]

→ $|\varepsilon_d| < 1$ ⇒ Inelastic demand [necessary good]

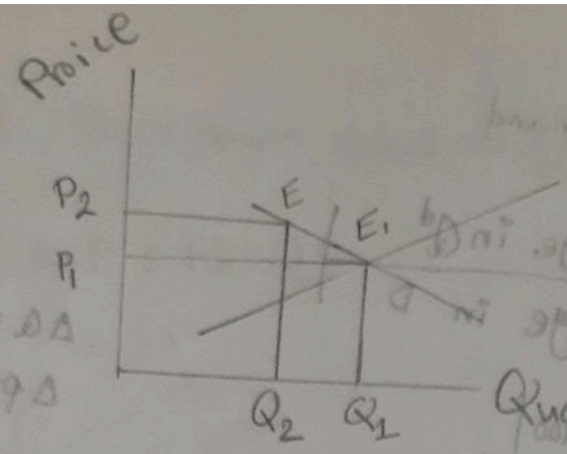
→ $|\varepsilon_d| = 1$ ⇒ Unit / Utility elastic demand.

→ $|\varepsilon_d| = 0$ ⇒ Perfectly elastic Demand

$|\varepsilon_d| = \infty$ ⇒

Total Revenue

Total Revenue (TR) = Price × Quantity

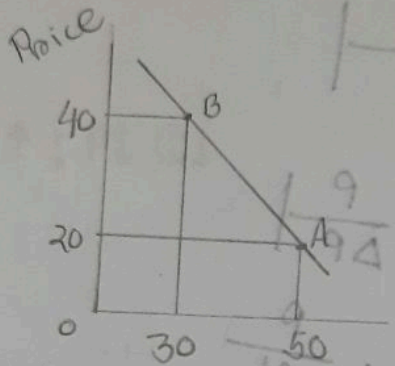


P↑ → Price increase by 10%

Q↓ → Quantity decrease by 15%

$$\xi_d = \frac{15}{10} = 1.5 \quad [\xi_d > 1 : \text{Elastic Demand}]$$

Example.



• Price Elasticity Demand? (PED)

• Price Elasticity Demand / PED / ξ_d = $\left| \frac{\text{Percentage change in } Q^d}{\text{Percentage change in } P} \right|$

B to A (ξ_d) = $\left| \frac{\frac{50-30}{30} \times 100\%}{\frac{20-40}{40} \times 100\%} \right|$

$= \left| \frac{20}{30} \times \frac{40}{-20} \right|$

$= |-1.33| = 1.33$

[There is a big inconsistency]

A to (ξ_d) = $\left| \frac{\frac{50-30}{50} \times 100\%}{\frac{20-40}{40} \times 100\%} \right| = 0.4$

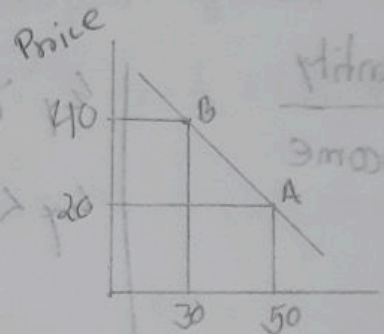
Mid Point Method.

We avoide this inconsistency

Step-1: Percentage in Quantity $= \frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}} \times 100$ (new, old)

Step-2: Percentage in Price $= \frac{P_2 - P_1}{\frac{P_1 + P_2}{2}} \times 100$ (new, old)

Step-3: PED $= \frac{\text{Percentage in Quantity}}{\text{Percentage in Price}}$



$$PED\ [A \text{ to } B] = \left| \frac{\frac{50-30}{\frac{50+30}{2}}}{\frac{40-20}{\frac{40+20}{2}}} \right|$$

$$= \left| \frac{20}{40} \times \frac{30}{20} \right| = |0.75| \rightarrow \text{Inelastic}$$

$$PED\ [B \text{ to } A] = \left| \frac{\frac{30-50}{(30+50) \div 2}}{\frac{20-40}{(20+40) \div 2}} \right| = |-0.75|$$

$$= 0.75 \rightarrow \text{Inelastic.}$$

The price Elasticity of Supply

$$\varepsilon_s = \frac{\%\Delta \text{ in Quantity Supply}}{\%\Delta \text{ in Price}} = \frac{\frac{Q_2 - Q_1}{(Q_2 + Q_1) \div 2}}{\frac{P_2 - P_1}{\frac{P_2 + P_1}{2}}}$$

- $\varepsilon_s > 1$: elastic Supply
- $\varepsilon_s < 1$: inelastic Supply
- $\varepsilon_s = 1$: Unit elastic Supply
- $\varepsilon_s = 0$: Perfect Inelastic Supply
- $\varepsilon_s = \infty$: Perfect elastic Supply

Income Elasticity Demand (YED) / ε_y

$$\varepsilon_y = \frac{\%\Delta \text{ in Quantity}}{\%\Delta \text{ in Income}} = \frac{\frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}}}{\frac{P_2 - P_1}{\frac{P_1 + P_2}{2}}}$$

- $\varepsilon_y > 0$: Normal goods
- $\varepsilon_y < 0$: Inferior goods

Crooss Price Elasticity of Demand (X_{ED} / ε_{xy})

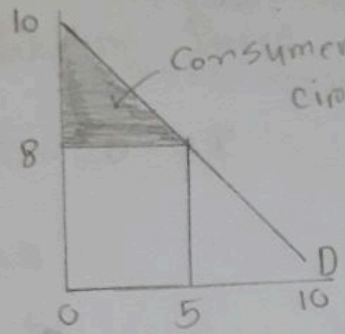
$$X_{ED} = \frac{\frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}}}{\frac{P_2 - P_1}{\frac{P_1 + P_2}{2}}}$$

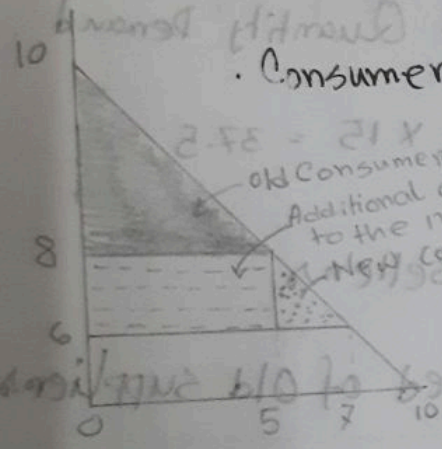
- $X_{ED} > 0$: Substitudes goods
- $X_{ED} < 0$: complementary goods
- $X_{ED} = 0$: neutral goods.

Week 5:

Consumer Ciruplus.

Consumer ciruplus = Willingness to Pay − Amount Paid





. Consumer ciruplus = $\frac{1}{2}$ × Δprice × Quantity Demand

$= \frac{1}{2} \times (10-8) \times 5 = 5$

1. New consumer ciruplus = $\frac{1}{2}$ × Δprice × Quantity

$= \frac{1}{2} (10-6) \times 7 = 14 = .$

2. Additional consumer ciruplus to the initial customer

= Δ price × Old Quantity Demand

$= (8-6) \times 5 = 10$

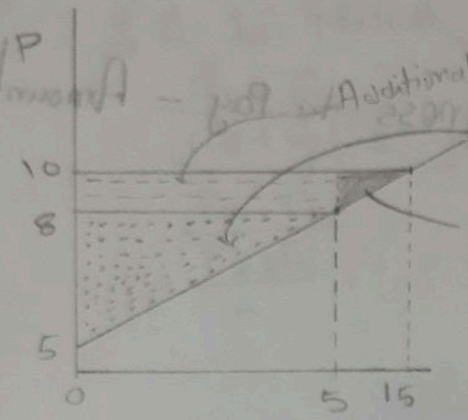
3. Consumer ciruplus to New customer = $\frac{1}{2}$ × Δprice × Δ Quantity

$= \frac{1}{2} \times (8-6) \times (7-5)$

$= 2.$

Producer Surplus

- Producer surplus = Amount Received - Willingnes to sell



1. New Producers surplus = $\frac{1}{2}$ × Δ Price × Quantity Demand

$= \frac{1}{2} \times (10-5) \times 15 = 37.5$

2. Additional Producer surplus to Old sellers

= Δ Price × Quantity Supplied of Old suppliers.

$= (10-8) \times 5$

3. Producer Surplus to the New Sellers.

$= \frac{1}{2} \times \Delta$ Price $\times \Delta$ Quantity

$= \frac{1}{2} \times (10-8) \times (15-5)$

$= 10$

Example

$Q_s = -10 + 2P$ → + ความชัน Supply

$Q_d = 20 - 2P$ → - ความชัน ของ Demand

At the equilibrium Price A the equilibrium quantity

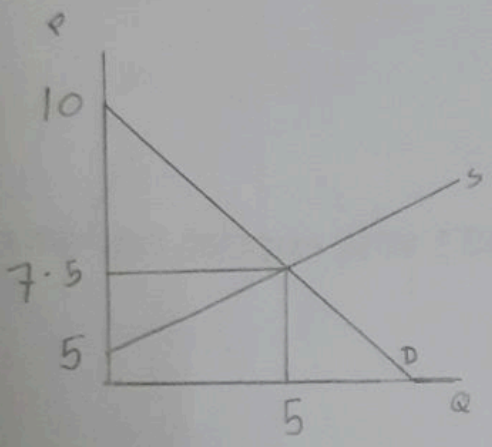
$-10 + 2P = 20 - 2P$

$4P = 30$

$P = 7.5$

$Q_s = -10 + 2 \times 7.5$

$= 5$



if $Q_D = 0$

$20 - 2P = 0$

$P = \frac{20}{2} = 1$

if $Q_s = 0$

$-10 + 2P = 0$

$P = \frac{10}{2} = 5$

- Consumer cinplus $= \frac{1}{2} \times (10 - 7.5) \times 5 = 6.25$
- Producer cinplus $= \frac{1}{2} \times (7.5 - 5) \times 5 = 6.25$
- Total cinplus $= 6.25 + 6.25 = 12.50$

$Q_D = 80 - 5P$ — (i)

$Q_S = -20 + 5P$ — (ii)

At the equilibrium price

$Q_D = Q_S$

$80 - 5P = -20 + 5P$

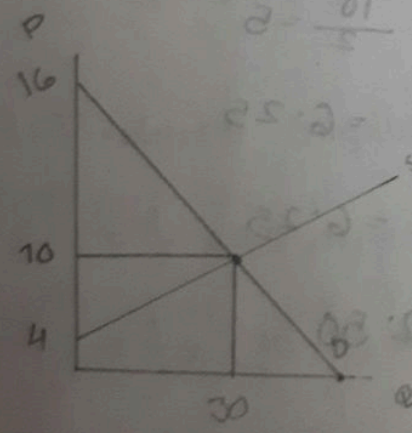
$-5P - 5P = -20 - 80$

$-10P = -100$

$P^* = 10$

At the equilibrium Quantity

$Q^* = 80 - 50 = 30$



if $Q_D = 0 \Rightarrow$

$80 - 5P = 0$

$5P = 80$

$\therefore P = 16$

if $Q_S = 0 \Rightarrow$

$-20 + 5P = 0$

$P = \frac{20}{5} = 4$

$\therefore$ Consumer surplus $= \frac{1}{2} \times (16-10) \times 30 = 90$

$\therefore$ Producer surplus $= \frac{1}{2} \times (10-4) \times 30 = 90$

Total surplus $= 90 + 90$

$= 180$