

Weeks - 6

LI

Elasticity

$$\frac{\Delta Q}{Q}$$

- Q - demand
supply
- $\frac{\Delta P}{P} \text{ or } \frac{\Delta I}{I} \text{ or } \frac{\Delta E_{ad}}{E_{ad}}$

- Price elasticity of demand

$$E = - \frac{\frac{\Delta Q_d}{Q_d}}{\frac{\Delta P}{P}} = - \frac{\Delta Q_d \times P}{\Delta P \times Q}$$

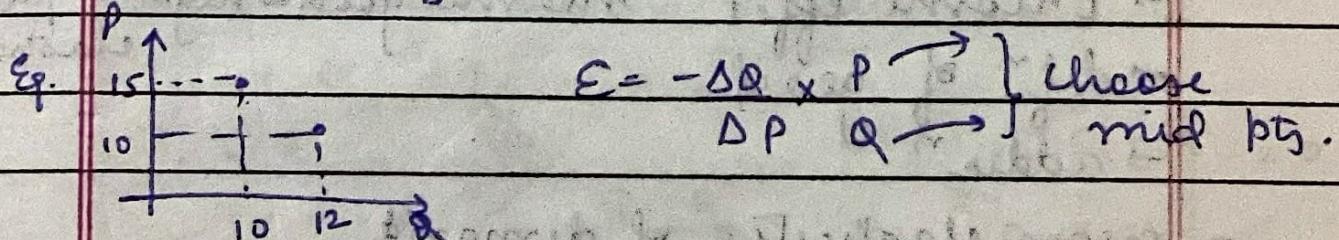
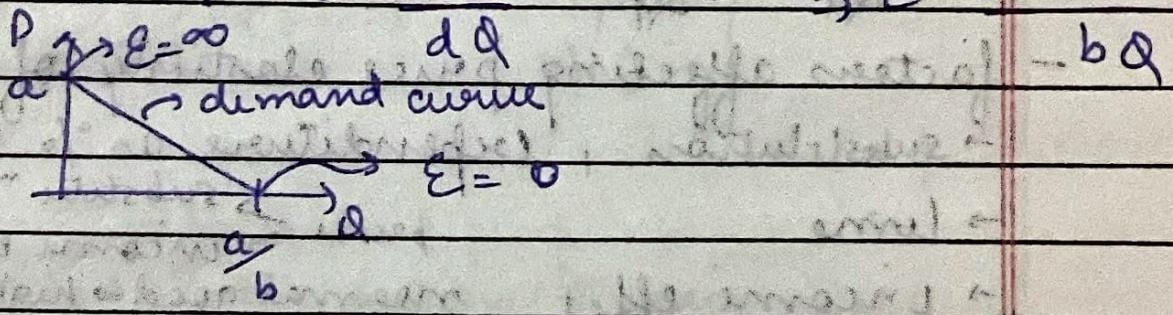
$$\text{Eq. } P = 10 \Rightarrow Q = \frac{10}{P} \Rightarrow \log Q = \log 10 - \log P$$

$$\frac{d \log Q}{d \log P} = -1 \Rightarrow - \frac{d \log Q}{d \log P} = 1$$

If P \downarrow s by 1% $\Rightarrow Q$ \uparrow s by 1% .

\hookrightarrow constant price elasticity of demand

$$\text{Eq. } P = a - bQ \Rightarrow \frac{dP}{dQ} = -b \Rightarrow E = a - bQ$$



- $E > 1 \Rightarrow$ elastic $\left. \right\} P \uparrow, Q \downarrow$
- $E < 1 \Rightarrow$ inelastic $\left. \right\} P \downarrow, Q \uparrow$

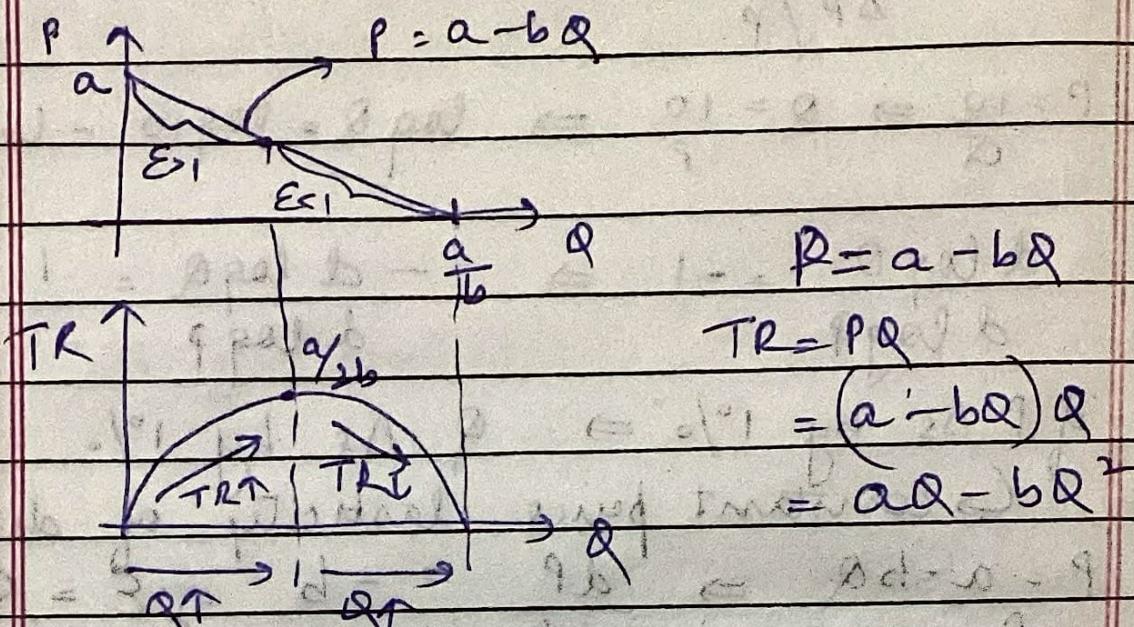
$$- TR = PQ \Rightarrow \frac{dTR}{dQ} = P \left(1 - \frac{1}{E} \right)$$

$$E = \infty \Rightarrow \frac{dTR}{dQ} = 0$$

$$\epsilon > 1 \Rightarrow \frac{dTR}{dQ} \rightarrow +ve \Rightarrow Q \uparrow, P \downarrow, TR \uparrow$$

$$\epsilon < 1 \Rightarrow \frac{dTR}{dQ} \rightarrow -ve \Rightarrow Q \uparrow, P \downarrow, TR \downarrow$$

- $\epsilon > 1 \rightarrow$ elastic, $\epsilon < 1 \rightarrow$ inelastic, $\epsilon = 1$ unit elastic



- factors affecting price elasticity of demand
 - substitutes, expenditure as % of budget
 - income $\xrightarrow{\text{price}} \text{substitution effect}$
 - income effect $\xrightarrow{\text{normal good}} \text{higher price elasticity}$
 - defn of good
 - additive

- Cross elasticity of demand

$$\epsilon_{12} = \frac{\Delta Q_1 / Q_1}{\Delta P_2 / P_2} \rightarrow \begin{cases} \text{substitutes} \Rightarrow \text{Price } P_2 \uparrow \rightarrow +ve \\ \text{complements} \Rightarrow -ve \end{cases}$$

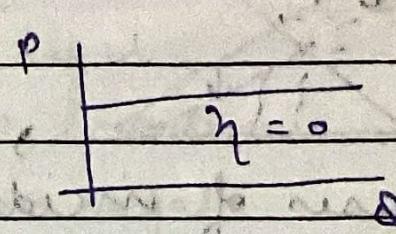
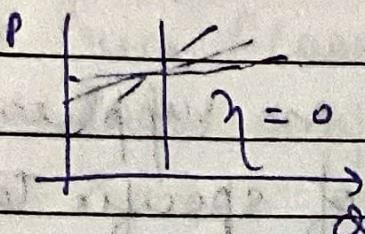
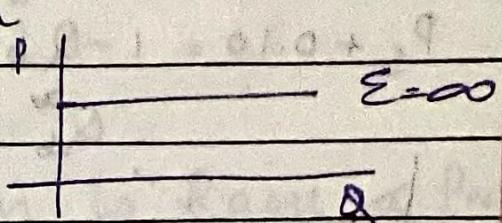
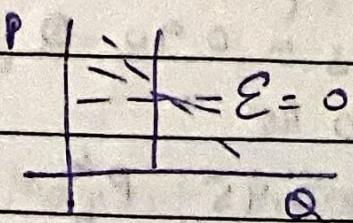
- Income elasticity of demand

$$\epsilon_I = \frac{\Delta Q / Q}{\Delta I / I} \quad \begin{cases} \text{normal } (\epsilon_I > 0) \Rightarrow \Delta I \uparrow, \Delta Q \uparrow \\ \text{inferior } (\epsilon_I < 0) \Rightarrow \Delta I \uparrow, \Delta Q \downarrow \end{cases}$$

- Price elasticity of supply

$$\eta = \frac{\Delta Q^S / Q^S}{\Delta P / P} = \frac{\Delta Q^S}{\Delta P} \times \frac{P}{Q^S}$$

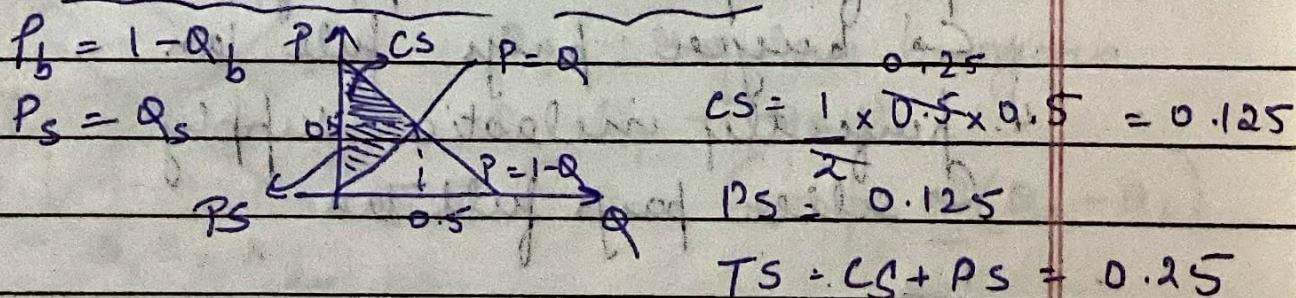
- $\epsilon \Rightarrow 0 \rightarrow \infty$, $\eta \Rightarrow 0 \rightarrow \infty$



- factors affecting η

- 1) availability of factors of production
- 2) production process & capacity
- 3) inventories
- 4) time

L2 Market Intervention: Taxes



- 3 types of tax

specific tax $\rightarrow 5\text{£} + 2\text{£} = 7\text{£}$ or $\text{£}10 + \text{£}1 = 11$

ad valorem \rightarrow on value tax % e.g. 0.1% tax

lump sum tax \rightarrow Total tax added

- Economic burden of taxes

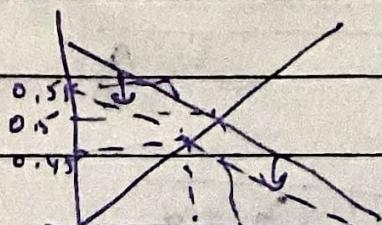
$$P_b = 1 - Q_b \quad 0.10 \text{ or taxes (buyer)}$$

$$P_s = Q_s$$

$$P_s + 0.10 = 1 - Q_b \Rightarrow P_s = 0.90 - Q_b$$

$$Q_b^* = Q_s^* = 0.45$$

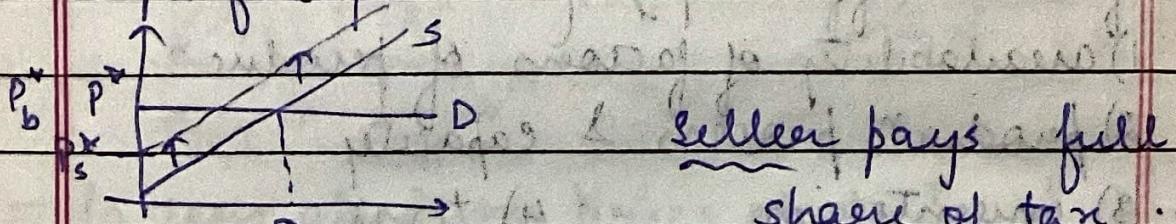
$$P_s^* = 0.45, P_b^* = 0.55$$



if an supplier

- 4 cases of incidence of specific taxes

1. perfectly elastic demand



2. perfectly inelastic demand

buyer pays full tax

3. perfectly elastic supply

buyer pays full tax

4. perfectly inelastic supply

seller pays full tax

$$\frac{1}{E_d} + \frac{1}{\eta_s} = \frac{n_s}{t}$$

$$\frac{1}{E_d} + \frac{1}{\eta_s} = E_d + \eta_s$$

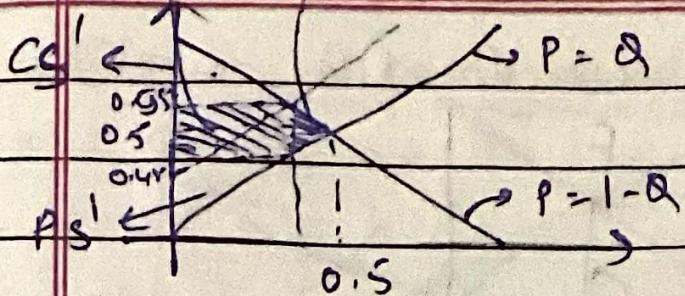
$$- \text{Ad valorem tax} \rightarrow t \rightarrow P(1+t)$$

~~not stated~~

govt. tax collec"
dead wt. loss

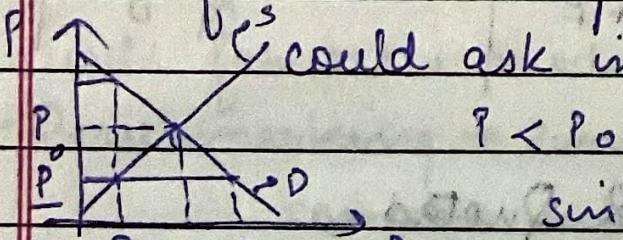
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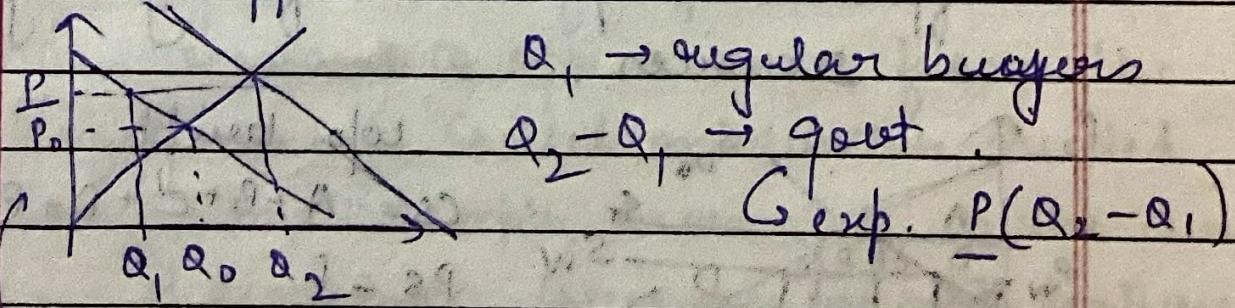
L3 Market Intervention to Raise a Price

1. Price Floor \rightarrow legal
 2. Price support \rightarrow economic
 3. Producer quota \rightarrow legal
 4. Voluntary producer reducⁿ \rightarrow economic
- Price floor \rightarrow min. price that a producer could ask in the market



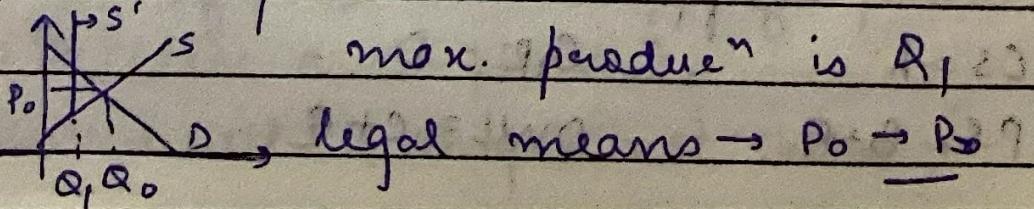
since $Q_1 < Q_2$, Q_1 items will be bought or sold.

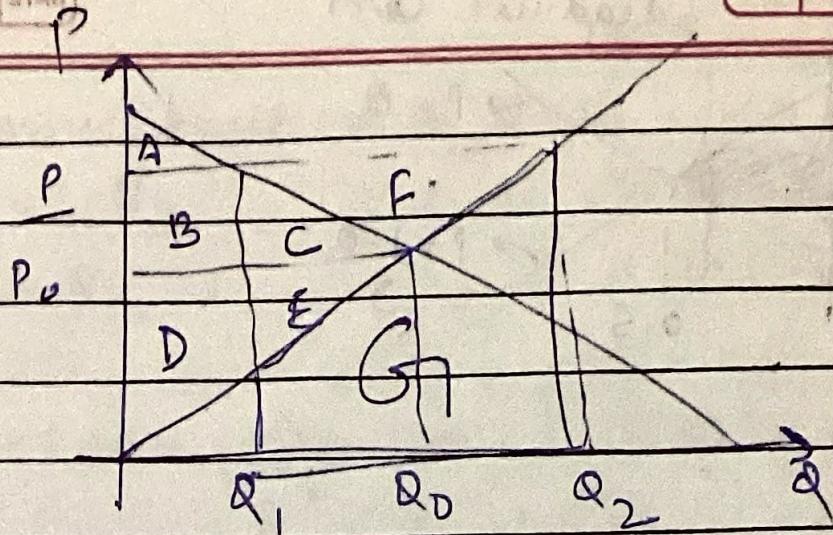
- Price support



\rightarrow MSP (min. selling price)

- Producer quota

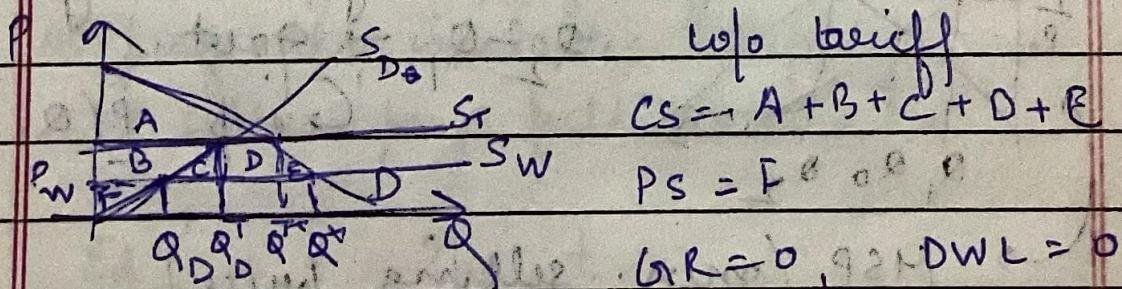




	CS	PS	GR	TS	DWL
No interne	A + B + C	D + E	0	A + B + C + D + E	0
Price floor	A	B + D	0	A + B + D	C + E
Price supp.	A	B + D + C + E + F	-C - E - F - G	A + B + D - G	C + E + G
Produc ^{ing}	A	B + D	0	A + B + D	C + E
Value PR	A	B + D + C + E + F	-C - E - F	A + B + D	C + E

L4 Import Tariff & Quotas

- total domestic surplus (TDS) = $CS|_D + PS|_D + GR$
- tariff → tax imposed on foreign goods & services



with tariff

$$CS = A \quad GR = D$$

$$PS = B + F \quad DWL = C + E$$