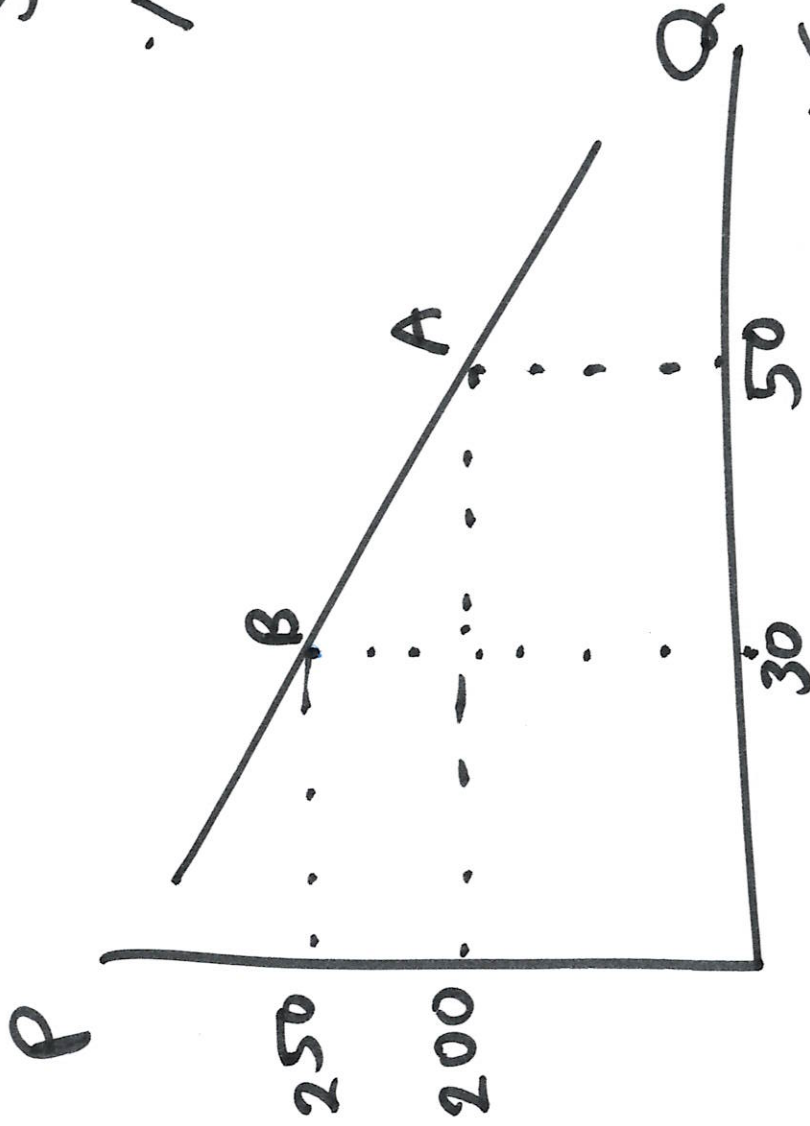


Standard Method

$$\% \Delta = \left(\frac{\text{end value} - \text{start value}}{\text{start value}} \right) \times 100 \%$$



$$\begin{aligned} \textcircled{1} \quad A \rightarrow B : \quad \% \Delta Q_d &= \frac{(30 - 50)}{50} \times 100 = -0.4 \\ \% \Delta P &= \frac{(250 - 200)}{(200)} = 0.25 \end{aligned} \quad \left. \vphantom{\begin{aligned} \% \Delta Q_d \\ \% \Delta P \end{aligned}} \right\} \begin{aligned} \varepsilon_d &= \frac{\% \Delta Q_d}{\% \Delta P} \\ &= \frac{-0.4}{0.25} \\ &= -1.6 \end{aligned}$$

2

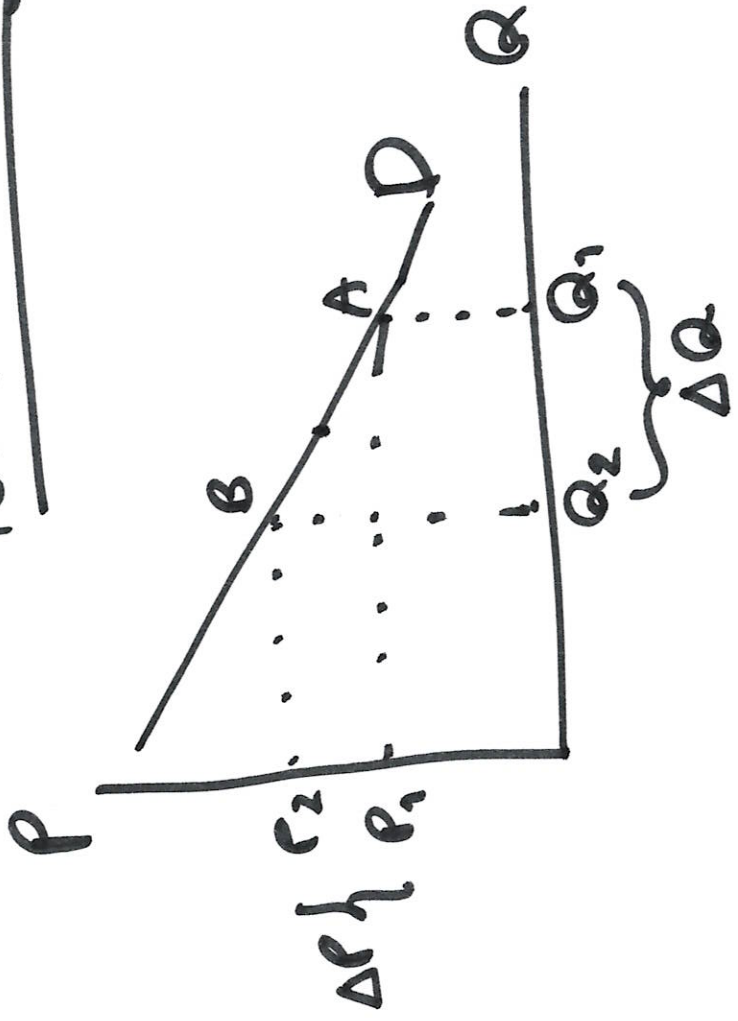
$$\textcircled{2} B_1 \rightarrow A : \cdot \Delta Q_d = \frac{50 - 30}{30} = 0.67$$

$$\cdot \Delta P = \frac{200 - 250}{250} = -0.2$$

$$\Rightarrow \epsilon_d = \frac{\cdot \Delta Q_d}{\cdot \Delta P} = \frac{0.67}{-0.2} = -3.35$$

3

Point Elasticity



slope of demand

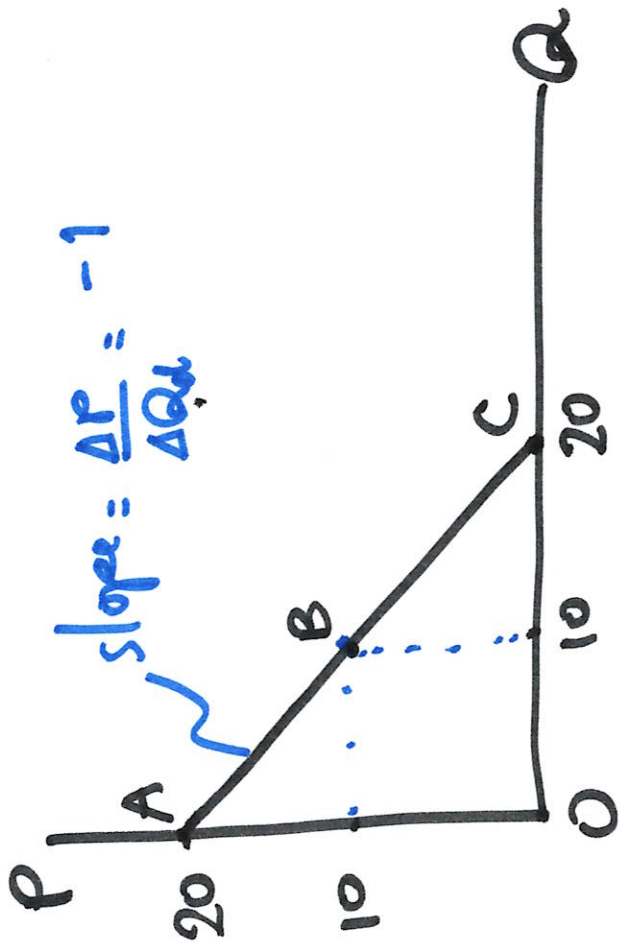
$$= \frac{\Delta P}{\Delta Q_d}$$

$$\epsilon_d = \frac{-1 \cdot \Delta Q_d}{-1 \cdot \Delta P} = \frac{\Delta Q_d / Q_d}{\Delta P / P}$$

$$= \frac{1}{\Delta P / \Delta Q_d} \cdot \frac{P}{Q_d}$$

$$\therefore \epsilon_d = \frac{1}{\text{slope of } D} \cdot \frac{P}{Q_d}$$

Ex: Given $P = 20 - Q$, find ϵ_d when $P = 20, 10, 0$. ④



$$\epsilon_d = \frac{\% \Delta Q_d}{\% \Delta P} = \frac{\Delta Q_d / Q_d}{\Delta P / P}$$

$$= \frac{\Delta Q_d}{\Delta P} \cdot \frac{P}{Q_d} = \frac{1}{\text{slope}} \cdot \frac{P}{Q_d}$$

$$\epsilon_d = \frac{1}{\Delta P / \Delta Q_d} \cdot \frac{P}{Q_d}$$

A: $P = 20 \rightarrow Q = 0 \Rightarrow \epsilon_d^A = \frac{1}{(-1)} \cdot \frac{20}{0} = -\infty$

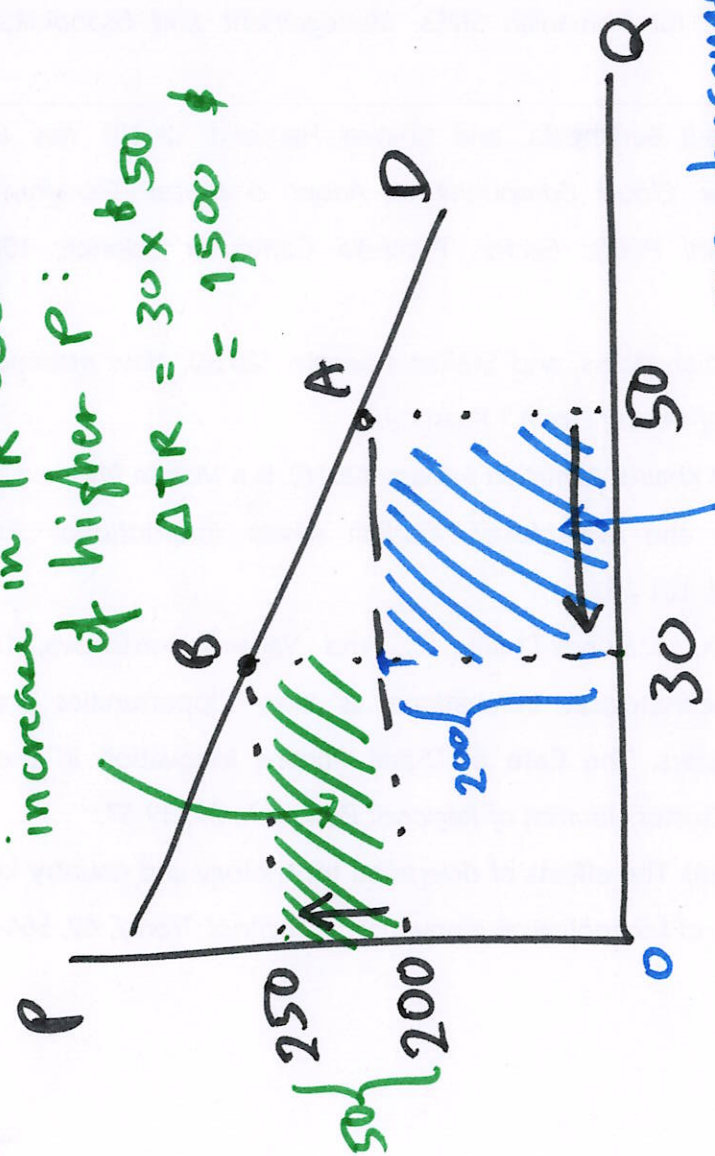
B: $P = 10 \rightarrow Q = 10 \Rightarrow \epsilon_d^B = \frac{1}{(-1)} \cdot \frac{10}{10} = -1$

C: $P = 0 \rightarrow Q = 20 \Rightarrow \epsilon_d^C = \frac{1}{(-1)} \cdot \frac{0}{20} = 0$

ΔTR & Ed

Case 1: Elastic demand.

increase in TR because of higher P:
 $\Delta TR = 30 \times \$50$
 $= 1,500 \$$



$$Ed = \frac{\% \Delta Qd}{\% \Delta P}$$

$$= \frac{(-20)/40}{50/225} = -2.25$$

$|Ed| > 1$: Price - elastic demand.

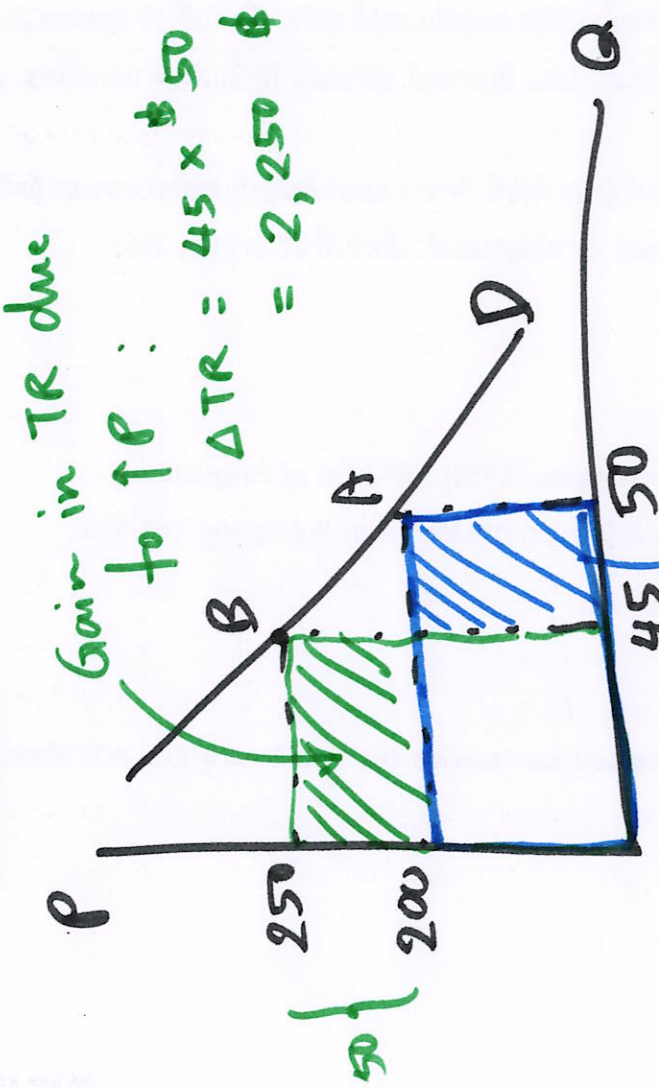
loss in TR because of lower Q.
 $\Delta TR = -20 \times 200$
 $= -\$4,000$

$$\therefore \Delta TR = \text{Gain due to } \uparrow P + \text{loss due to } \downarrow Q$$

$$= +1,500 - 4,000$$

$$= -2,500 \text{ lost.}$$

Case 2: Inelastic Demand



$$\begin{aligned}
 \epsilon_d &= \frac{\% \Delta Q}{\% \Delta P} \\
 &= \frac{(-5) / 47.5}{50 / 225} \\
 &= -0.47
 \end{aligned}$$

$|\epsilon_d| = 0.47 < 1 \rightarrow$ Price - inelastic demand.

new TR \square old TR \square
 Loss in TR b/c of $\downarrow Q$: $\Delta TR = (-5) \times \$200 = -1000$ Bakt.

$$\therefore \Delta TR = 2,250 - 1000 = 1,250 \text{ Bakt.}$$

$$\begin{aligned}
 \text{Alternatively, } \Delta TR &= TR^{\text{new}} - TR^{\text{old}} \\
 &= (250 \times 45) - (200 \times 50) \\
 &= 11,250 - 10,000 = 1,250
 \end{aligned}$$