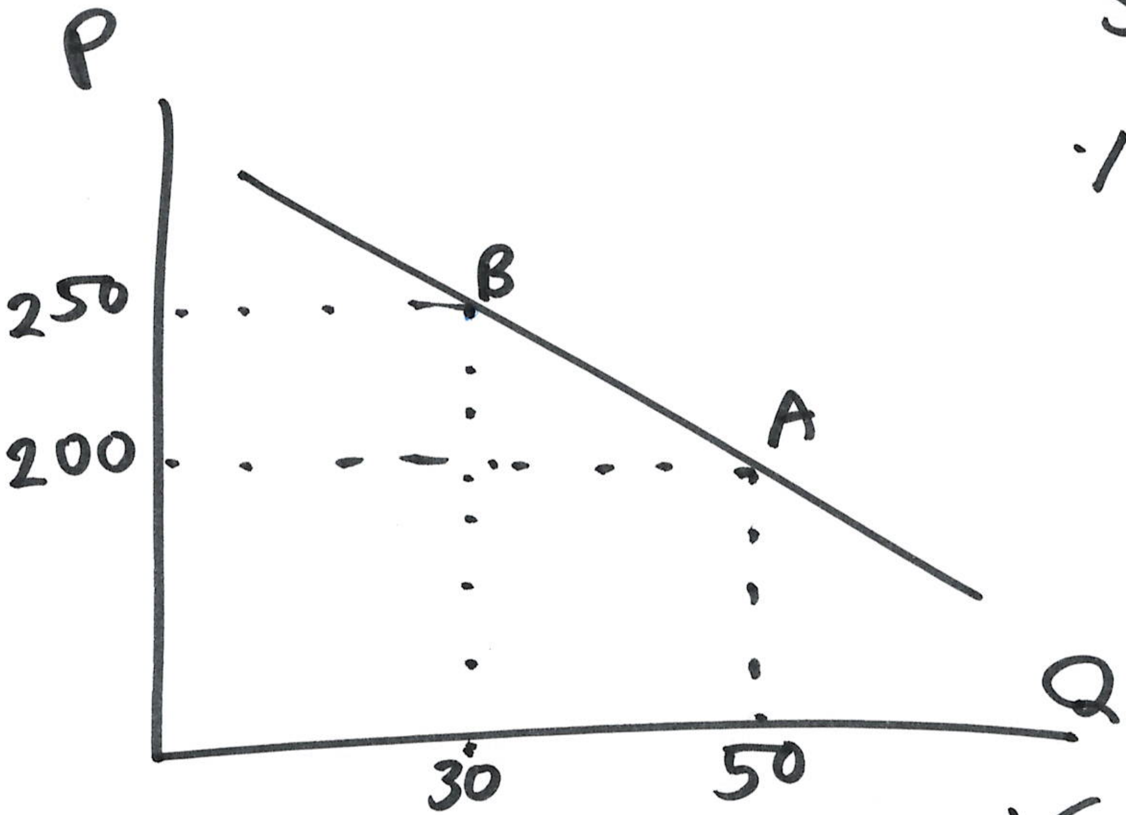
[EE 211 - Sept. 8, 2020]



Standard Method

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

① A → B :

$$\%\Delta Q_d = \frac{(30-50)\ \text{kg}}{50\ \text{kg}} = -0.4$$

$$\%\Delta P = \frac{\$(250-200)}{\$(200)} = 0.25$$

$$\varepsilon_d = \frac{\%\Delta Q_d}{\%P} = \frac{-0.4}{0.25} = -1.6$$

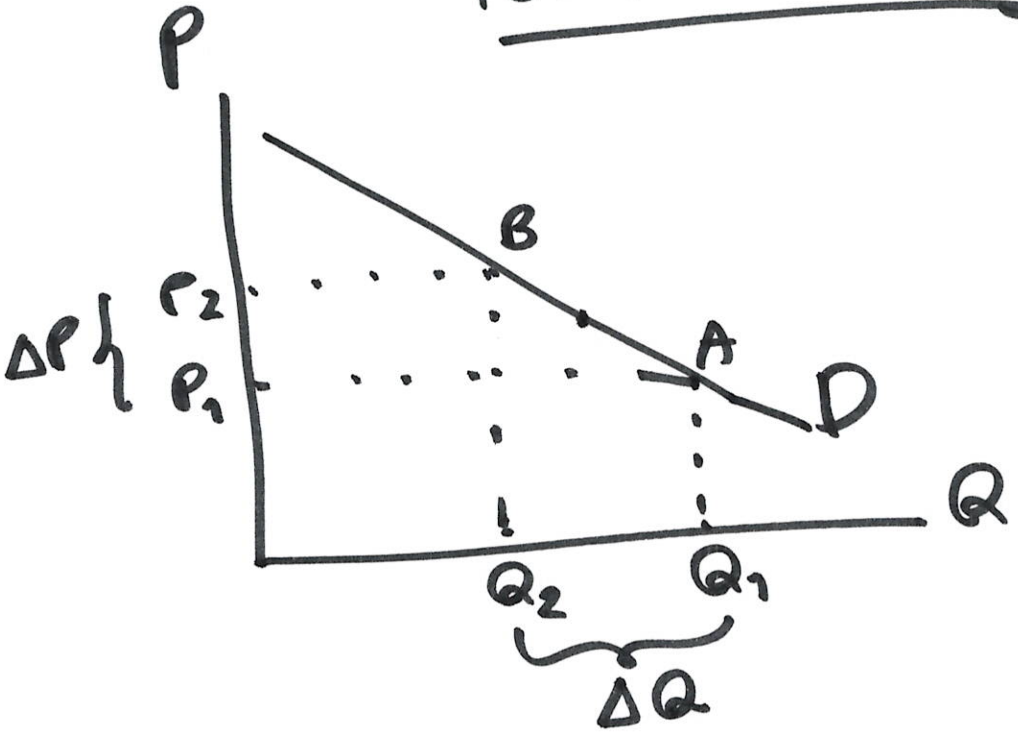
(2) B → A :

$$\%\Delta Q_d = \frac{50 - 30}{30} = 0.67$$

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

$$\Rightarrow \varepsilon_d = \frac{\%\Delta Q_d}{\%\Delta P} = \frac{0.67}{-0.2} = -3.35$$

Point Elasticity



slope of demand

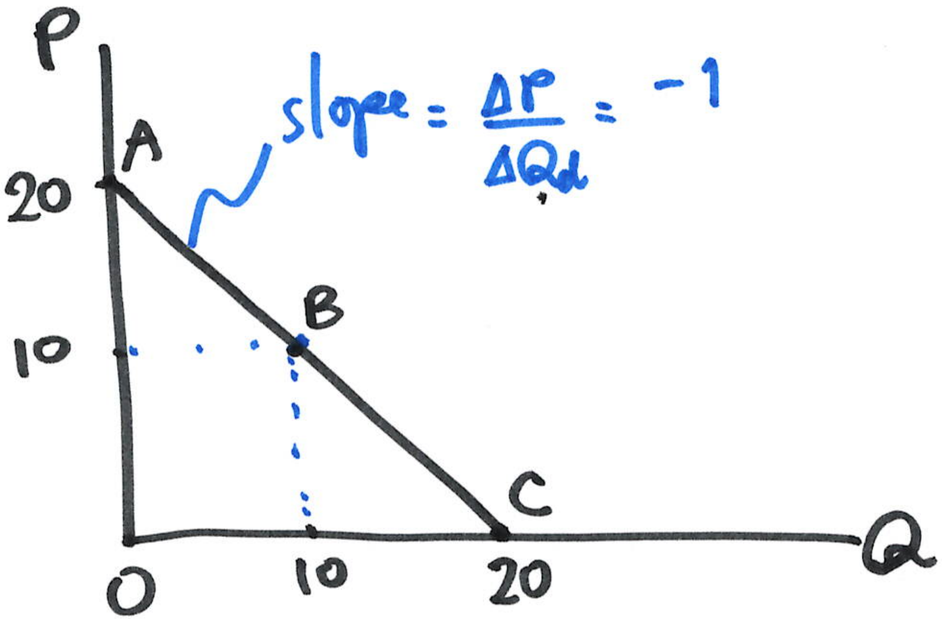
$$= \frac{\Delta P}{\Delta Q_d}$$

$$\varepsilon_d = \frac{\%\Delta Q_d}{\%\Delta P} = \frac{\Delta Q_d / Q_d}{\Delta P / P} = \frac{\Delta Q_d}{\Delta P} \cdot \frac{P}{Q_d}$$

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

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

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



$$\varepsilon_d = \frac{\%\,\Delta Q_d}{\%\,\Delta P} = \frac{\Delta Q_d / Q_d}{\Delta P / P}$$

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

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

A: $P = 20 \rightarrow Q = 0$

B: $P = 10 \rightarrow Q = 10$

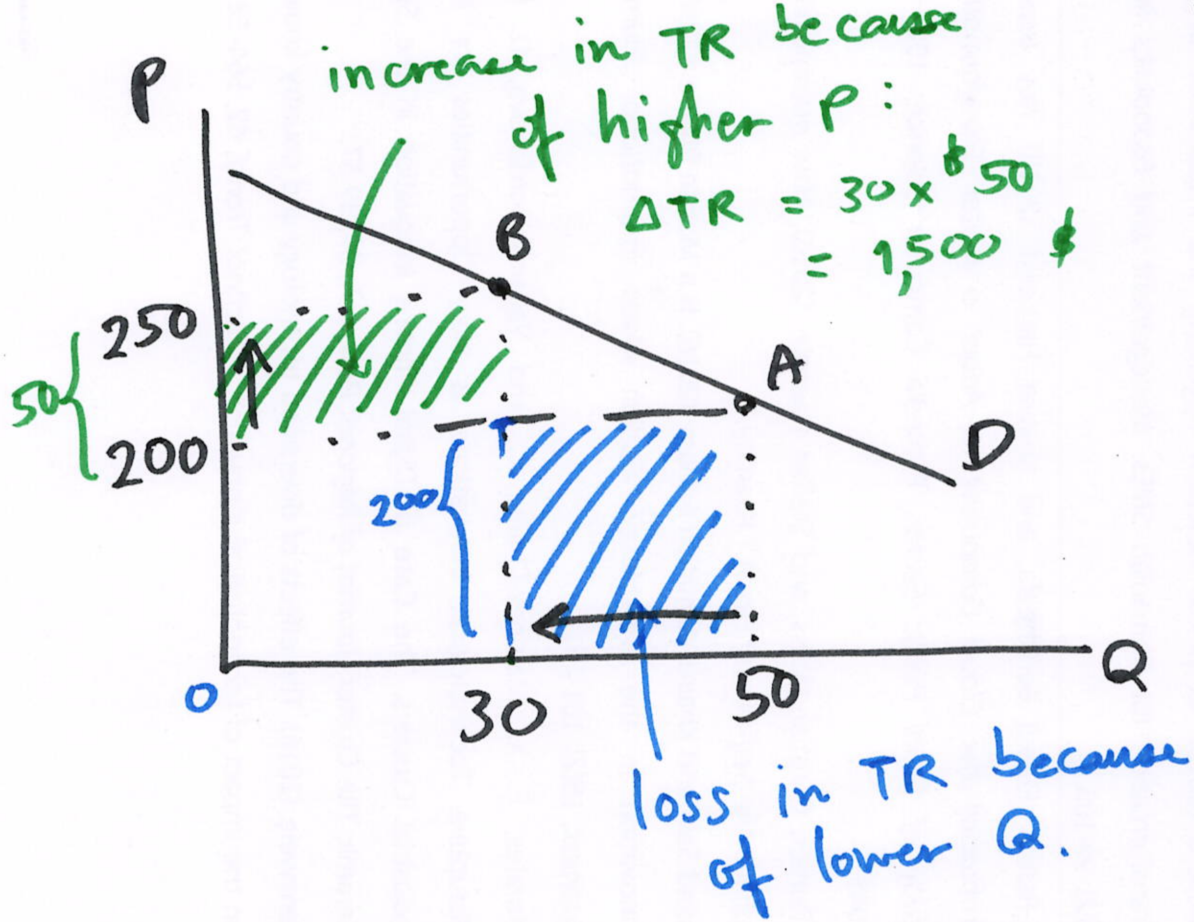
C: $P = 0 \rightarrow Q = 20$

$$\Rightarrow \varepsilon_d^{A} = \frac{1}{(-1)} \cdot \frac{20}{0} = -\infty$$

$$\Rightarrow \varepsilon_d^{B} = \frac{1}{(-1)} \cdot \frac{10}{10} = -1$$

$$\Rightarrow \varepsilon_d^{C} = \frac{1}{(-1)} \cdot \frac{0}{20} = 0$$

ΔTR & $\mathcal{E}d$



$\Delta TR = -20 \times \$200 = -\$4{,}000$

Case 1: Elastic demand.

$$\mathcal{E}d = \frac{\%\Delta Qd}{\%\Delta P}$$

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

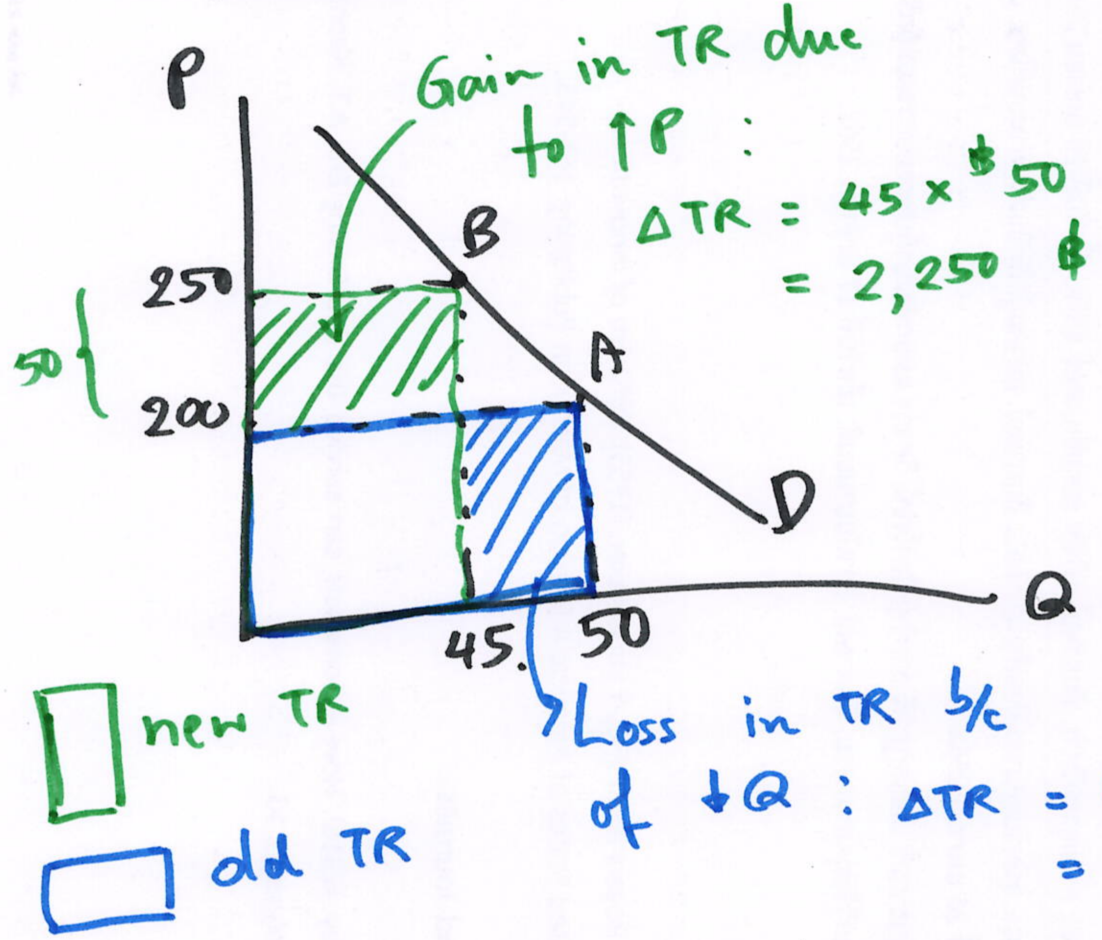
$|\mathcal{E}d| > 1$: Price-elastic demand.

$\therefore \Delta TR$ = Gain due to ↑P + loss due to ↓Q

= +1,500 − 4,000

= −2,500 baht.

Case 2 : Inelastic Demand



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

$$= \frac{(-5)/47.5}{50/225}$$

$$= -0.47$$

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

$\therefore \underline{\Delta TR = 2,250 - 1000 = 1,250}$ Baht.

Alternatively, $\Delta TR = TR^{new} - TR^{old}$

$= (250 \times 45) - (200 \times 50)$

$= 11,250 - 10,000 =$ ฿1250