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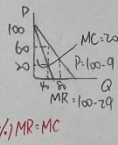
4. 獨占廠商面臨的需求函數 $P = 100 - Q$
成本函數 $C = 30 + 20Q$

(A) 均衡價格、產量、利潤為多少?

$$TR = (100 - Q)Q = 100Q - Q^2$$

$$MR = 100 - 2Q$$

$$MC = 20$$



$$\Rightarrow 100 - 2Q = 20, Q = 40, P = 60$$

$$\pi = 2400 - 800 = 1600$$

(B) 無謂損失為多少?

$$\frac{40 \times 40}{2} = 800$$

(C) 獨占力?

$$\frac{P - MC}{P} = \frac{60 - 20}{60} = 0.67$$

(D) 每單位課以 10 元之從量稅，求稅後 P, Q, π

$$\pi = 100 - Q^2 - (30 + 20Q) - 10Q$$

$$= -Q^2 + 70Q - 30$$

$$\frac{d\pi}{dQ} = -2Q + 70 = 0 \Rightarrow Q = 35, P = 65$$

$$\pi = 2275 - 1225 = 1050$$

$$\pi = 2275 - 1225 - 10 \times 35 = 1195$$

(E) 課 10% 從價稅，求稅後 P, Q, π

$$\pi = -Q^2 + 70Q - 30 - 0.1(100Q - Q^2)$$

$$= -Q^2 + 70Q - 30 - 10Q + 0.1Q^2$$

$$= -0.9Q^2 + 60Q - 30$$

$$\frac{d\pi}{dQ} = -1.8Q + 60 = 0 \Rightarrow Q = 33.3, P = 66.67$$

$$\pi = 2222 - 696.6 = 1525.4$$

(F) 課 100 元的定額稅，求稅後 P, Q, π

價格、產量不影響

$$\pi = 1570 - 100 = 1470$$

(G) 課 20% 利潤稅，求稅後 P, Q, π

價格、產量不影響

$$\pi = 1570(1 - 0.2) = 1256$$

(H) 按 MC 訂價，廠商會有多少損失?

無謂損失為多少?

$$P = MC = 100 - Q = 20 \Rightarrow Q = 80, P = 20$$

$$\pi = 1600 - 1600 = 0$$

無謂損失 = 0

5. 設獨占廠商均衡下， P 是 MC 的 4 倍，求均衡時之需求彈性

$P = 4MC$

$$\frac{P - MC}{P} = \frac{1}{\epsilon} \Rightarrow \frac{4MC - MC}{4MC} = \frac{1}{\epsilon} \Rightarrow \frac{3}{4} = \frac{1}{\epsilon}$$

$$\epsilon = 4, \epsilon = \frac{4}{3}$$

6. 若需求函數為線性， $LMC = k$ 則課徵從量稅 t 元，消費者面對的價格會因此上漲 $\frac{1}{2}t$ 元。(對) or 錯

$$P = a - bQ, MR = a - 2bQ$$

$$P = a - \frac{a - (k+t)}{2} = \frac{a + (k+t)}{2}$$

稅後利潤極大化之 Q 時， $P = \frac{a+k}{2}$
條件： $MR = MC + t$
 $\Rightarrow a - 2bQ = k + t \Rightarrow Q = \frac{a - (k+t)}{2b}$
 $P = a - bQ = \frac{a + (k+t)}{2}$

7. 需求函數 $P = 280 - Q$, $TC_A = 29Q$, $TC_B = 49Q$ ，求均衡下的 P, Q

$$TR = 280Q - Q^2, MR = 280 - 2Q, MC_A = 49, MC_B = 29$$

$$280 - 2Q = 49 \Rightarrow Q_A = 115.5$$

$$280 - 2Q = 29 \Rightarrow Q_B = 125.5$$

$$P = 280 - 115.5 = 164.5$$

$$MC_A = MC_B = MR$$

$$\Rightarrow 49A = 89B = 280 - 2Q_A - 2Q_B$$

$$Q_A = 40, Q_B = 20, P = 220$$