

Week 14

題目 3.

$$(A) MRA = MC \cdot 100 - 2q_A = 20 \Rightarrow q_A = 40 \Rightarrow P_A = 60.$$

$$MRB = MC \cdot 80 - 2q_B = 20 \Rightarrow q_B = 30 \Rightarrow P_B = 50$$

$$TL = 60 \times 40 + 50 \times 30 - 20 \times (40 + 30) = 2500 = PS.$$

(B) 先將需求水平相加 (統一單位)

$$CS = CS_A + CS_B = 800 + 450 = 1250$$

$$TS = CS + PS = 3750$$

$$\begin{cases} P = 100 - q, & q \leq 20 \\ = 90 - 0.5q, & q > 20 \end{cases} \Rightarrow \begin{cases} MR_1 = 100 - 2q, & q \leq 20 \\ MR_2 = 20 - q, & q > 20 \end{cases}$$

$$\text{令 } MR_1 = MC \Rightarrow 100 - 2q = 20 \Rightarrow q = 40 \text{ (不合)}$$

$$\text{再令 } MR_2 = MC \Rightarrow 20 - q = 20 \Rightarrow q = 0 \text{ (不合)} \rightarrow P = 55$$

$$TL = 55 \times 70 - 20 \times 70 = 2450 = PS$$

$$CS = CS_A + CS_B = 1012.5 + 512.5 = 1525$$

$$TS = 3775$$

$$(C) F = (80 - P) \times q / 2 = (80 - P)(80 - P) / 2 = (80 - P)^2 / 2.$$

$$TL = 2F + (P - 20)(q_A + q_B) = (80 - P)^2 + (P - 20)(180 - 2P) = -P^2 + 60P + 2800$$

$$\text{由一階條件可解得 } P = 30 \text{ 故 } F = 1250, q = 120, TL = 3700$$

$$CS = CS_A(P=30) + CS_B(P=30) - 2F = 2450 + 1250 - 2500 = 1200$$

$$TS = CS + PS = 1200 + 3700 = 4900.$$