

$$(A) MR_A = MC = 100 - 2q_A = 20 \Rightarrow q_A = 40 \Rightarrow P_A = 60 \quad \pi = 60 \times 40 + 50 \times 30 - 20 \times (40 + 30) = 1750 \quad (PS)$$

$$MR_B = MC = 80 - 2q_B = 20 \Rightarrow q_B = 30 \Rightarrow P_B = 50 \quad CS = CS_A + CS_B = 800 + 450 = 1250$$

$$(B) Q = q_A + q_B = 180 - 2P$$

$$\begin{cases} P = 100 - q_A \\ P = 80 - q_B \end{cases} \Rightarrow \begin{cases} q_A = 100 - P \\ q_B = 80 - P \end{cases}$$

$$TS = CS + PS = 3750$$

$$CS = CS_A + CS_B$$

$$\Delta = \frac{1}{2} Q^* (P^* - P^x)$$

$$CS_A = \frac{1}{2} (100 - 55) 45$$

$$+ CS_B = \frac{1}{2} (80 - 55) 25$$

$$CS = 1012.5 + 312.5 = 1325$$

$$SW = PS + CS = 1325 + 24450 = 3775$$

$$(C) F = (80 - P) \times \frac{q}{2} = (80 - P)(80 - P) / 2 = (80 - P)^2 / 2$$

$$\pi = 2F + (P - 20)(q_A + q_B) = (80 - P)^2 +$$

$$(P - 20)(180 - 2P) = -P^2 + 60P + 2800$$

$$\text{由一階條件得 } P = 30 \quad F = 1250$$

$$q_A = 70 \quad q_B = 50 \quad \pi = 3700 \quad (PS)$$

$$CS = CS_A + CS_B = \frac{1}{2} (100 - 30) 70 + \frac{1}{2} (80 - 30) 50$$

$$= 3700$$

$$CS^* = CS - 2F = 3700 - 2500 = 1200$$

$$SW = \pi + CS^* = 4900$$

