week14

3. (A) $MR_A = MC \quad 100 - 2q^A = 20 \Rightarrow q_A = 40 \Rightarrow P_A = 60$

$MR_B = MC \quad 80 - 2q_B = 20 \Rightarrow q_B = 30 \Rightarrow P_B = 50$

$TC = 60 \times 40 + 50 \times 30 - 20(40+30) = 2500 = P_S$

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

$TS = CS + PS = 3750$

(B) 先把需求水平增加線一定价)

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

令 $MR_1 = MC \Rightarrow 100 - 2q = 20 \Rightarrow q = 40$ (不合). 再令 $MR_2 = MC$

$90 - q = 20 \Rightarrow q = 70$ (合) $\rightarrow P = 55$

$\pi_2 = 55 \times 70 - 20 \times 70 = 2450 = PS$ $CS = CS_A + CS_B = 101.5 + 512.5 = 1525$

$TS = 3977.5$

(C)

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

$\pi = 2P + (P-20)(q_A + q_B) = (80-P)^2 + (P-20)(180-2P) = -P^2 + 60P + 1$

由一階條件解 $\Rightarrow P = 30$ 士女子 $= 1250$, $q = 120$ $\pi_C = 3700$

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

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