

Week 15

$$(A) 60 - 2q = 30 \Rightarrow q = 15 \Rightarrow p = 45 \Rightarrow \pi = 45 \times 15 - 30 \times 15 = 225$$

= PS

$$CS = 15 \times 15 / 2 = 112.5, TS = 225 + 112.5 = 337.5, DWL = 112.5$$

$$(B) 60 - q = 30 \Rightarrow q = 30 \Rightarrow \pi = 30 \times 30 / 2 = 450$$

$$CS = 0, TS = 0 + 450 = 450, DWL = 0$$

$$(C) \pi = p(q_1)q_1 + p(q_2)(q_2 - q_1) - TC(q_2) - (60 - q_1)q_1 + (60 - q_2)$$

$$(q_2 - q_1) - 30q_2 = q_1^2 - q_2^2 + 30q_2 + q_1q_2$$

$$- \text{階條件為: } -2q_1 + q_2 = 0, -2q_2 + 30 + q_1 = 0$$

$$\Rightarrow \text{聯立解 } q_1 = 10, q_2 = 20$$

$$\text{對應之價格為: } p_1 = 50, p_2 = 40 \Rightarrow \pi = 50 \times 10 + 40 \times (20 - 10)$$

$$- 30 \times 20 = 300$$

$$TS = 100 + 300 = 400, DWL = 450 - 400 = 50$$

$$(D) \pi = p(q_1)q_1 + p(q_2)(q_2 - q_1) + p(q_3 - q_2) - TC(q_3)$$

$$= (60 - q_1)q_1 + (60 - q_2)(q_2 - q_1) + (60 - q_3)(q_3 - q_2) - 30q_3$$

$$= q_1^2 - q_2^2 - q_3^2 + 30q_3 + q_1q_2 + q_2q_3$$

$$- \text{階條件為: } -2q_1 + q_2 = 0, -2q_2 + q_2 + q_3 = 0, -2q_3 + 30 + q_2 = 0$$

$$\text{聯立解: } q_1 = 7.5, q_2 = 15, q_3 = 22.5$$

$$\text{對應之價格為 } p_1 = 52.5, p_2 = 45, p_3 = 52.5$$

$$\Rightarrow \pi = 52.5 \times 7.5 + 45 \times (15 - 7.5) + 37.5 (22.5 - 15) - 30 \times 22.5 = 337.5$$