

(C) $C=100$ week 15

(A) $60 - q \Rightarrow q = 15 \Rightarrow q = 45 \Rightarrow \pi = 45 \times 15 - 30 \times 15 = 225 = PS$
 $CS = 15 \times \frac{15}{2} = 112.5, TS = 225 + 112.5 = 337.5, DWL = 112.5$

(B) $60 - q = 30 \Rightarrow q = 30 \Rightarrow \pi = 30 \times 30 = 450, CS = 0, TS = 0 + 450 = 450, DWL = 0$
 $(C) \pi = P(q_1)q_1 + P(q_2)(q_2 - q_1) - TC(q_2) = (60 - q_1)q_1 + (60 - q_2)(q_2 - q_1) - 30q_2$
 $= -q_1^2 - q_2^2 + 30q_2 + q_1q_2$
 一階條件: $-2q_1 + q_2 = 0, -2q_2 + 30 + q_1 = 0 \Rightarrow$ 聯立得 $q_1 = 10, q_2 = 20$

對應價格: $p_1 = 50, p_2 = 40 \Rightarrow \pi = 50 \times 10 + 40 \times (20 - 10) - 30 \times 20 = 300$
 $CS = (10 \times \frac{10}{2}) + (10 \times \frac{10}{2}) = 100, TS = 100 + 300 = 400, DWL = 450 - 400 = 50$

(D) $\pi = P(q_1)q_1 + P(q_2)(q_2 - q_1) + P(q_3)(q_3 - q_2) - TC(q_3)$
 $= (60 - q_1)q_1 + (60 - q_2)(q_2 - q_1) + (60 - q_3)(q_3 - q_2) - 30q_3$
 一階條件: $-2q_1 + q_2 = 0, -2q_2 + q_1 + q_3 = 0 \Rightarrow$ 聯立得 $q_2 = 45, q_3 = 52.5$
 $\Rightarrow \pi = 52.5 \times 7.5 + 45 \times (15 - 7.5) + 37.5 \times (22.5 - 15) - 30 \times 52.5 = 337.5$
 $CS = (7.5 \times \frac{7.5}{2}) + (7.5 \times \frac{7.5}{2}) + (7.5 \times \frac{7.5}{2}) = 84.375$
 $DWL = 450 - 421.625 = 28.375$