

1.

$$\textcircled{A} \begin{array}{l} MR = 60 - 2q \quad MR = MC \\ MC = 30 \quad \Rightarrow q = 15, p = 45 \end{array}$$

$$\pi = 15 \times 45 - 30 \times 15 = 225$$

$$CS = \frac{15 \times 15}{2} = 112.5$$

$$PS = 675 - 450 = 225$$

$$TS = 112.5 + 225 = 337.5$$

$$\textcircled{B} \begin{array}{l} P = MC \Rightarrow 60 - q = 30 \\ q = 30, p = 30 \end{array}$$

$$\pi = \frac{30 \times 30}{2} + 30 \times 30 - 30 \times 30 = 450$$

$$CS = 0$$

$$PS = 1350 - 900 = 450$$

$$TS = 450$$

$$\begin{aligned} \textcircled{C} \pi &= (60 - q_1) \times q_1 + (60 - q_2) \times (q_2 - q_1) - 30q_2 \\ &= \cancel{60q_1} + 60q_2 \\ &= 60q_1 - q_1^2 + 60q_2 - 60q_1 - q_1^2 + q_1q_2 - 30q_2 \\ q_1 &= 10, q_2 = 20 \quad p_1 = 50, p_2 = 40 \end{aligned}$$

$$\pi = 50 \times 10 + 40 \times 10 - 30 \times 20 = 300$$