

4.

(A) $q = 10L^{0.5}K^{0.5} \rightarrow L^* = \frac{q^2}{100K}$

$STC = 10L^* + 10K = \frac{q^2}{10K} + 10K$

$AC = \frac{q}{10K} + \frac{10K}{q}, MC = \frac{q}{5K}$

(B) $\frac{dSTC}{dK} = \frac{-q^2}{10K^2} + 10 = 0 \Rightarrow \tilde{K} = \frac{q}{10}$, 代入 STC 函数中:

$TC = STC(K = \tilde{K}) = \frac{q^2}{10 \times (q/10)} + 10 \frac{q}{10} = q + q = 2q$

7.

(A) $AFC = \frac{FC}{q} = \frac{50}{10} = 5$

(B) $AVC = q^2 - 12q + 1 \rightarrow \frac{dAVC}{dq} = 2q - 12 = 0 \Rightarrow q = 6$.

(C) AVC 遞增時, APL 遞減, 故產量 ≥ 6 。

(D) $MC = 3q^2 - 24q + 1 \Rightarrow \frac{dMC}{dq} = 6q - 24 = 0 \Rightarrow q = 4$

MC 遞增時, MP_L 遞減, 故產量 ≥ 4 。