

1. $STC = q^3 - 12q^2 + q + 50$

① AFC (平均固定成本) = $\frac{50}{q} = 5$

② $AVC = q^2 - 12q - 1$

$\frac{dAVC}{dq} = 2q - 12 = 0 \Rightarrow q = 6$

③ 生产量成本对称性 $\Rightarrow AVC \uparrow, AP_2 \downarrow$
 $\Rightarrow q \geq 6$

④ $MC = 3q^2 - 24q - 1$

$\frac{dMC}{dq} = 6q - 24 = 0 \Rightarrow q = 4$

$MC \uparrow, MP_2 \downarrow \Rightarrow q \geq 4$

4.

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

$STC = 10 L^* + 10k = (q^2 / 10k) + 10k$

$AC = (q / 10k) + (10k / q), MC = (q / 5k)$

(B) $\frac{\partial STC}{\partial k} = \frac{-q^2}{10k^2} + 10 = 0 \Rightarrow \tilde{k} = \frac{q}{10}$

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