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) $\frac{STC}{K} = \frac{q^2}{10K^2} + 10 = 0$, $\tilde{K} = \frac{q}{10}$

$TC = STC(K=\tilde{K}) \Rightarrow \frac{q^2}{10\left(\frac{q}{10}\right)^2} + 10\frac{q}{10} = 0.$

$\Rightarrow TC(10) = 2 \times 10 = 20.$

7. (A) $AFC = \frac{TC}{q} = \frac{50}{10} = 5$

(B) $AVC = q^2 - 12q + 1 \Rightarrow 2q - 12 = 0 \Rightarrow q = 6$

(C) 當 AVC 遞增，APL 遞減 $\Rightarrow q > 6$

(D) $MC = 3q^2 - 24q + 1 \Rightarrow 6q - 24 = 0 \Rightarrow q = 4.$

當 MC 遞增，$MP_L$ 遞減 $\Rightarrow q > 4$