Week 5

3. (A) 技術A成本函数：TC(A) = 生產成本 + 租賃成本.

生產成本 = $q = \frac{L}{2} = \frac{K}{4} \rightarrow L = 2k,\ K = 4q \rightarrow C = 1\times 2q + 2\times 4q = 10q$

$TC_A = 10q + 40$ #

$q = \frac{L}{4} = \frac{K}{2} \rightarrow L = 4q,\ K = 2q \rightarrow C = 1\times 4q + 2\times 2q = 8q$ $TC_B = 8q + 100$ #

(B) $q = 20,\ TC_A = 240,\ TC_B = 260$，故应買A技術 #

(C) $q = 40,\ TC_A = 440,\ TC_B = 420$，故应買B技術 #

(D) 令 $TC_A < TC_B$，則 $q < 30$，買A技術 #

4. 生產函数：$q = 10L^{0.5}K^{0.5}$，且 $W = r = 10$

(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) $\frac{\partial STC}{\partial k} = \frac{-q^2}{10k^2} + 10 = 0 \rightarrow k = \frac{q}{10}$，代入 STC

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

$= 2q$ #