

3/4 已知生產函數, $q = 10L^{0.5}K^{0.5}$, 且 $w = r = 10$

(A) 求等成本線方程式

$$\bar{C} = wL + rK$$

$$\bar{C} = 10L + 10K$$

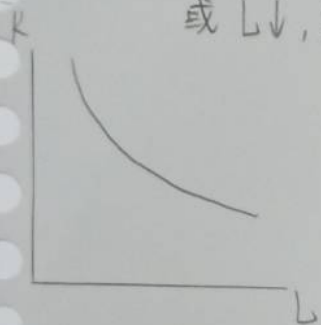
(B) 求邊際技術替代率函數

$$MRTS = \frac{MP_L}{MP_K} = \frac{5L^{-\frac{1}{2}}K^{\frac{1}{2}}}{5L^{\frac{1}{2}}K^{-\frac{1}{2}}} = \frac{K}{L}$$

(C) 等產量線會凸向原點嗎?

會, 因為 $L \uparrow, K \downarrow$ 時, $MRTS$ 下降

或 $L \downarrow, K \uparrow$ 時, $MRTS$ 上升, 故等產量線凸向原點



(D) 求條件要素需求函數

$$\begin{cases} \frac{K}{L} = \frac{10}{10} & (\text{相切條件}) \\ q = 10L^{0.5}K^{0.5} & (\text{限制條件}) \end{cases} \rightarrow \begin{cases} \frac{MP_L}{w} = \frac{MP_K}{r} & (\text{相切條件}) \\ q = 10L^{0.5}K^{0.5} & (\text{限制條件}) \end{cases}$$

$$\frac{5L^{-0.5}K^{0.5}}{10} = \frac{5L^{0.5}K^{-0.5}}{10}$$

$$\frac{K^{0.5}}{2L^{0.5}} = \frac{L^{0.5}}{2K^{0.5}}$$

$$K = L \quad (\text{帶回限制式})$$

$$q = 10L^{0.5}K^{0.5} = 10L$$

$$L = 0.18 \rightarrow K = 0.18$$

(E) 求總成本, 平均成本與邊際成本函數

$$LTC = 10 \times 0.18 + 10 \times 0.18 = 28$$

$$LAC = \frac{LTC}{q} = 2$$

$$LMC = \frac{dLTC}{dq} = 2$$

(F) 生產 10 單位的最低成本多少?

$$LTC(10) = 2 \times 10 = 20$$