

L	K	q	APL	APK	MPL
0	0	0	0	0	0
5	10	20	4	1	20
10	20	43	4.3	2.15	23
15	30	57	3.8	2.85	14
20	40	67	3.35	3.35	10
25	50	75	3	3.75	8

$$APL = \frac{q}{L}$$

$$MPL = \frac{dq}{dL}$$

Week 2

2.  $q = 21 + 9L^2 - L^3$  (A)  $-3L^2 + 18L + 21 = 0$  (B)  $-3L^2 + 18L + 21 = 0$

$$APL = 21 + 9L - L^2$$

$$MPL = 21 + 18L - 3L^2$$

$$-6L + 18 = 0$$

$$-6L = -18$$

$$L = 3$$

$$L^2 - 6L - 7 = (L+1)(L-7)$$

$$L = 1$$

$$L = -1 \vee 7$$

(不合)

(C)  $21 + 9L - L^2 = 21 + 18L - 3L^2$

$$2L^2 - 9L = 0$$

$$L(2L - 9) = 0$$

$$L = 0 \vee \frac{9}{2} \quad A = \frac{9}{2}$$

3.  $MPL = 5$

$q = 500$

$q = f(L, K)$

$500 = f(10, 5)$

$MPL = 10$

4. (A)  $q = 5A + 10B$

(B)  $q = \min(L/2, K)$





工業技術研究院  
Industrial Technology  
Research Institute

A108260015 陳政寬 經濟二甲  
Week 3

Topic: 11/9/2014

Date: \_\_\_\_\_

Place: \_\_\_\_\_

5. (a)  $F(k, L) = k^{\frac{1}{2}} L^{\frac{1}{2}}$

(b)  $F(k, L) = 2k + L$

$MRTS \cdot \frac{-dk}{dL} = \frac{MP_L}{MP_K} = \frac{\frac{1}{2}(\frac{1}{2} \cdot k^{\frac{1}{2}} \cdot L^{\frac{1}{2}})}{\frac{1}{2}(\frac{1}{2} \cdot k^{\frac{1}{2}} \cdot L^{\frac{1}{2}})} = \frac{k}{L}$

$MRTS = \frac{-dk}{dL} = \frac{MP_L}{MP_K} = \frac{1}{2}$

8. A = (3), 因為 MRTS 固定為  $\frac{2}{3}$

9. A: 具有完全替代性的線性生產函數

B 具有完全替代性的線性生產函數

C. 完全不具替代性的 Leontief 生產函數

Week 3 加分

生產函數  $q = 5L$      $q = 2L + 3K$      $q = \min\{L, K\}$      $q = L^{0.2} L^{0.5} + 0.8K^{0.5}$



# Week 3 加分

生產函數  $q$

$$q = 5LH$$

$$q = 2L + 3K$$

$$q = \min(L, K)$$

$$q = L^{0.2} C^{-0.5} + 0.8K^{0.5}$$

APC 邊際產量

$$5L^{-1}K$$

$$2L^{-1} + 3K$$

$$0$$

$$\frac{1}{4}$$

MTRS 邊際技術替代率

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

$$\frac{2}{3}$$

$$0$$

$$EL = \frac{0.2 + 0.8K}{0.2L + 0.8K}$$

規模報酬

$$EL = \frac{1}{L} \cdot \frac{1}{K}$$

$$2$$

$$EL = \frac{2 + 3K}{2L + 3K}$$

$$EL = 0$$

$$EL = \frac{0.2K + 0.8}{0.2L + 0.8K}$$

生產力彈性

$$\frac{L}{K}$$

$$\frac{5 + 5L}{2L + 3K}$$

$$0$$

$$\frac{H}{K} \cdot L$$

替代彈性

$$\frac{1}{2}$$

$$\infty$$

$$0$$

$$\frac{H}{K} \cdot L$$

$$q = f(L, C, K) = P_L L^{-1} + P_C C^{-1} + P_K K^{-1} = 0.2L^{-1} + 0.5C^{-1} + 0.8K^{-1}$$



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Week 4

Topic: \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

1. (A)  $LT C = wL + rk \Rightarrow LT C = 10L + 10K$

(B)  $MRTS_{LK} = \frac{\Delta K}{\Delta L} = \frac{dK}{dL}$

(C) 會  $L \uparrow, K \downarrow$  時  $MRTS_{LK} \uparrow$

(D)  $L^* = L(w, r, q) + rk(w, r, q) \Rightarrow q = 10L^{0.5} K^{0.5}$

(E) 總成本  $LT C = wL(w, r, q) \Rightarrow$   ~~$q = 10L^{0.5} K^{0.5}$~~   $L K (w, r, q) \Rightarrow 2q$   
平均成本  $LA (= \frac{LT C(w, r, q)}{q}) \Rightarrow 2$

邊際成本  $LMC = \frac{\partial LT C(w, r, q)}{\partial q} \Rightarrow 2$

(F)  $LT C = wL^* + rk^* \Rightarrow TC(10) = 2 \times 10 \Rightarrow 20$



Week 6 A108260015

4. (A)  $q = 10L^{0.5}K^{0.5} \Rightarrow L^* = \frac{q^2}{10K}$   $STC = 10L^* + 10K = \frac{q^2}{10K} + 10K$

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

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

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

7. (A)  $ATC = \frac{TC}{q} = \frac{50}{q} = 5$  (B)  $AVC = q^2 - 12q + 1 \Rightarrow 2q - 12 < 0 \Rightarrow q < 6$

(C) 当  $AVC$  递增,  $APL$  递减  $\Rightarrow q \geq 6$

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

当  $MC$  递增  $MP$  递减  $\Rightarrow q > 4$