

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

$$MRTS = \frac{K}{L} \rightarrow \sigma = \frac{d \ln(\frac{K}{L})}{d \ln MRTS} = \frac{d \frac{K}{L}}{d \frac{K}{L}} = 1$$

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

$$MRTS = \frac{1}{2} \rightarrow \sigma = \frac{d \ln(\frac{K}{L})}{d \ln MRTS} = \frac{d \ln(\frac{K}{L})}{d \ln \frac{1}{2}} = \infty$$

8.  $Q = 3K + 2L = f(K, L)$

$$f(\alpha K, \alpha L) = 3(\alpha K) + 2(\alpha L) = \alpha(3K + 2L) = \alpha Q \rightarrow R = 1$$

故 (1) 正確; (2) 錯誤

$$MRTS = \frac{2}{3} \rightarrow \sigma = \frac{d \ln(\frac{K}{L})}{d \ln MRTS} = \frac{d \ln(\frac{K}{L})}{d \ln(\frac{2}{3})} = \infty \text{ 為固定}$$

故 (3) 錯誤 正確

9. (A)  $q = (L^\alpha + K^\alpha)^\beta \rightarrow (tL^\alpha + tK^\alpha)^\beta = [t \cdot (L^\alpha + K^\alpha)]^\beta$   
 $= t^\beta (L^\alpha + K^\alpha)^\beta = t^\beta \cdot q$

若  $\beta > 1$  為 IRTS;  $\beta = 1$  為 CRTS;  $\beta < 1$  為 DRTS

(B)  $\ln q = 5 + 0.5 \ln L + 0.2 \ln K \rightarrow 5 + 0.5 \ln(t \cdot L) + 0.2 \ln(t \cdot K)$   
 $= 5 + 0.7 \ln t + 0.5 \ln L + 0.2 \ln K$   
 $= 0.7 \ln t + \ln q$

(C)  $q = [\min\{aK, bL\}]^\alpha \rightarrow [\min\{atK, btL\}]^\alpha = t^\alpha \cdot [\min\{aK, bL\}]^\alpha$

若  $\alpha > 1$  為 IRTS;  $\alpha = 1$  為 CRTS;  $\alpha < 1$  為 DRTS

7.

	$q = 5LK$	$q = 2L + 3K$	$q = \min\{L, K\}$	$q = (0.2L^{0.5} + 0.8K^{0.5})^2$
邊際產量	$5K; 5L$	$2; 3$	折衷 $L$	(1)
邊際技術替代率	$\frac{K}{L}$	$\frac{2}{3}$	$1, 0, \infty$	$0.25(\frac{K}{L})^{0.5}$
規模報酬	IRS	CRS	CRS	CRS
產量彈性	$\epsilon_L = \epsilon_K = 1$	$\epsilon_L = \frac{2L}{2L+3K}; \epsilon_K = \frac{3K}{2L+3K}$	折衷	(2)
生產力彈性	2	1	1	1
替代彈性	1	$\infty$	0	$\frac{2}{3}$

(1)  $MP_L = 0.2(0.2L^{-0.5} + 0.8K^{-0.5})^{-0.5} L^{0.5}$   
 $MP_K = 0.8(0.2L^{-0.5} + 0.8K^{-0.5})^{-0.5} K^{0.5}$

(2)  $\epsilon_L = \frac{0.12L^{-0.5}}{0.2L^{-0.5} + 0.8K^{-0.5}}$   
 $\epsilon_K = \frac{0.8K^{-0.5}}{0.2L^{-0.5} + 0.8K^{-0.5}}$