

$$5. MRTS_{LK} = \frac{MP_L}{MP_K}, MP_L = \frac{1}{2} L^{\frac{1}{2}} K^{\frac{1}{2}}, MP_K = \frac{1}{2} L^{\frac{1}{2}} K^{\frac{1}{2}}$$

$$(a) MRTS_{LK} = \frac{K}{L} = \frac{\Delta(\frac{K}{L})}{\Delta MRTS_{LK}} = 1$$

$$\sigma = 1 \times \frac{MRTS_{LK}}{\frac{K}{L}} = 1$$

$$(b) MRTS_{LK} = \frac{MP_L}{MP_K} = \frac{1}{2}, MRTS_{LK} = 0$$

$$\sigma = \frac{\Delta(\frac{K}{L})}{\Delta MRTS_{LK}} = \frac{MRTS_{LK}}{\frac{K}{L}} = \frac{\% \Delta(\frac{K}{L})}{0} = \infty$$

8. (1) 若 K 和 L 同時增加 x 倍 $\rightarrow xK, xL$, 生產函數 $Q = 3K + 2L$

$$F(xK, xL) = 3(xK) + 2(xL) = x(3K + 2L) = xQ$$

產出也增加 x 倍, 生產函數為固定規模報酬, 正確

$$(2) MP_L = \frac{\partial Q}{\partial L} = 2, MP_K = \frac{\partial Q}{\partial K} = 3$$

MP_L 和 MP_K 皆固定, 沒有邊際生產力遞減, 不正確

$$(3) MRTS_{LK} = \frac{MP_L}{MP_K} = \frac{2}{3}$$

邊際技術替代率為固定值, 正確

$$9. (A) F(\lambda L, \lambda K) = [(\lambda L)^a + (\lambda K)^a]^{\frac{1}{a}} = \lambda^{\frac{a+1}{a}} Q$$

$\alpha\beta = 1$: CRS, $\alpha\beta > 1$: IRS, $\alpha\beta < 1$: DRS

$$(B) \text{左右取 } e, Q = e^5 L^{0.5} K^{0.2} \Rightarrow \text{DRS}$$

$$(C) F(\lambda L, \lambda K) = [\text{Min}(a\lambda L, b\lambda K)]^a = \lambda^a Q$$

$\alpha = 1$: CRS, $\alpha > 1$: IRS, $\alpha < 1$: DRS