

9. 隨堂作業.

9.

技術A: $q = \min\{\frac{1}{2}, \frac{1}{4}\}$

技術B: $q = \min\{\frac{1}{4}, \frac{1}{2}\}$

假設 $w=1, r=2$.

(A) 技術A: $q = \frac{1}{2} = \frac{K}{4}, L^* = 4q, K^* = 2q$

$\bar{C} = 2q + 8q = 10q$

$LTC_A = 10q + 40$

技術B: $q = \frac{1}{4} = \frac{K}{2}, L^* = 4q, K^* = 2q$

$\bar{C} = 4q + 4q = 8q$

$LTC_B = 8q + 100$

(B) $TC_A = 10 \times 20 + 40 = 240$

$TC_B = 8 \times 20 + 100 = 260$

$TC_B > TC_A$, 故選擇A技術

(C) $TC_A = 10 \times 40 + 40 = 440$

$TC_B = 8 \times 40 + 100 = 420$

$TC_A > TC_B$, 故選擇B技術

(D) $TC_B > TC_A$

$8q + 100 > 10q + 40$

$60 > 2q$

$q < 30$

當 $q < 30$ 時, 選擇A技術

11. $q = 10L^{0.5}K^{0.5}, w=r=10$, 設K固定為K。

(A) $q = 10L^{\frac{1}{2}}K^{\frac{1}{2}}, L^* = \frac{q^2}{100K}$

$STC = 10L^* + 10K = (\frac{q^2}{100K}) + 10K$

$AC = (\frac{q}{10K}) + (\frac{10K}{q})$

$MC = (\frac{q}{5K})$

(B) $\frac{dSTC}{dK} = \frac{-q^2}{10K^2} + 10 = 0 \Rightarrow K = \frac{q}{10}$ 代入STC函數

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

12. $q = 20, AC - AVC = AFC = 10$

$FC = AFC \times q = 10 \times 20 = 200$

$q = 40, AC - AVC = AFC = \frac{FC}{q} = \frac{200}{40} = 5$

13. $MC = 10q$, 固定成本 = 100元, 產量為10單位

$VC(10) = \int_0^{10} 10q dq = 5q^2 \Big|_0^{10} = 500$

$TC = VC + FC = 500 + 100 = 600$