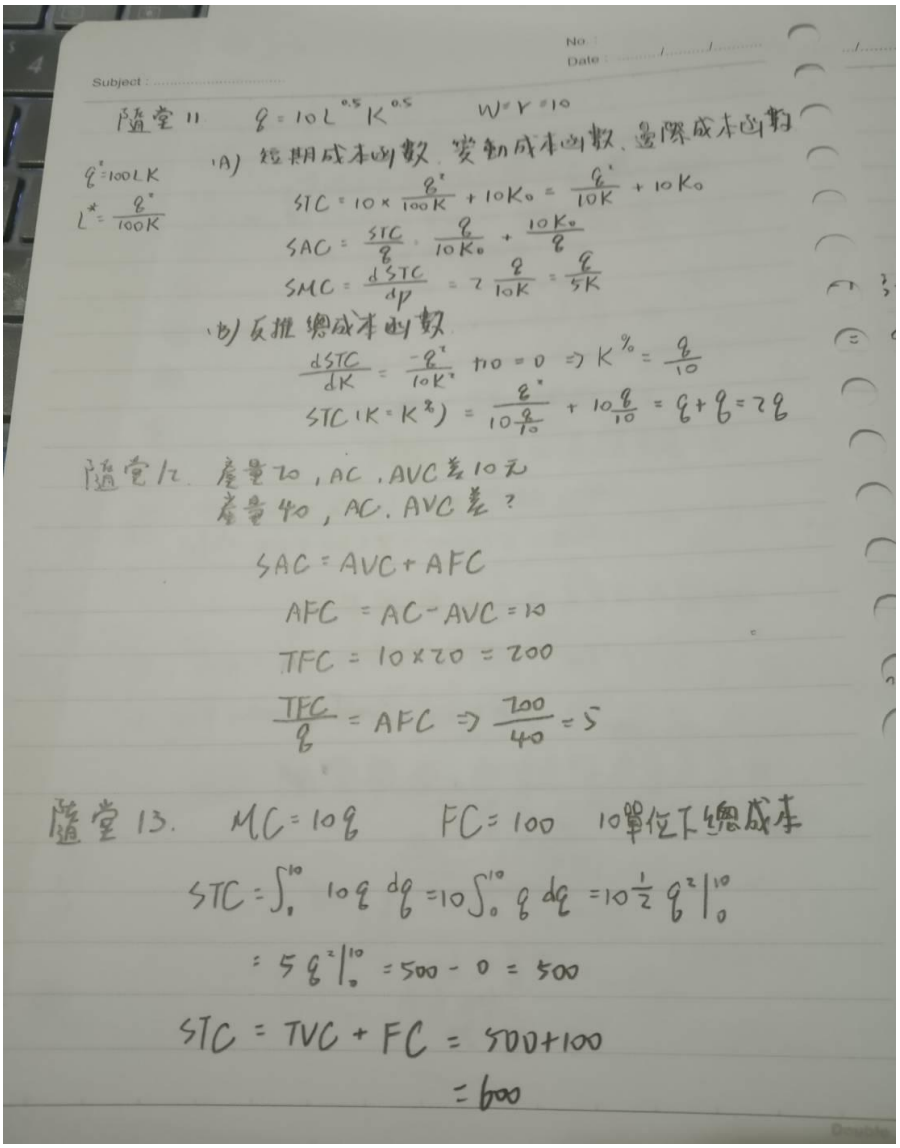

隨堂11 $Q = 10L^{0.5}K^{0.5}$ $W=r=10$

$Q^* = 100LK$

$L^* = \frac{Q^*}{100K}$

(A) 短期成本函數、變動成本函數、邊際成本函數

$STC = 10 \times \frac{Q^2}{100K} + 10K_0 = \frac{Q^2}{10K} + 10K_0$

$SAC = \frac{STC}{Q} = \frac{Q}{10K_0} + \frac{10K_0}{Q}$

$SMC = \frac{dSTC}{dQ} = 2\frac{Q}{10K} = \frac{Q}{5K}$

(B) 反推總成本函數

$\frac{dSTC}{dK} = \frac{-Q^2}{10K^2} + 10 = 0 \Rightarrow K^* = \frac{Q}{10}$

$STC(K=K^*) = \frac{Q^2}{10\frac{Q}{10}} + 10\frac{Q}{10} = Q + Q = 2Q$

隨堂12. 產量20，AC、AVC差10元

產量40，AC、AVC差？

$SAC = AVC + AFC$

$AFC = AC - AVC = 10$

$TFC = 10 \times 20 = 200$

$\frac{TFC}{Q} = AFC \Rightarrow \frac{200}{40} = 5$

隨堂13. $MC = 10Q$ $FC = 100$ 10單位下總成本

$STC = \int_0^{10} 10Q\,dQ = 10\int_0^{10} Q\,dQ = 10\frac{1}{2}Q^2\Big|_0^{10}$

$= 5Q^2\Big|_0^{10} = 500 - 0 = 500$

$STC = TVC + FC = 500 + 100$

$= 600$

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隨堂9. 技術A: $q = \min\{L/2, K/4\}$ 設 $w=1$
技術B: $q = \min\{L/4, K/2\}$ $r=2$

(A) 分別購買兩種技術，總成本函數.

A. $q = L/2 = K/4 \Rightarrow L=2q, K=4q$

$C = 1\times 2q + 2\times 4q = 10q$

$TC_A = 10q + 40$

B. $q = L/4 = K/2 \Rightarrow L=4q, K=2q$

$C = 1\times 4q + 2\times 2q = 8q$

$TC_B = 8q + 100$

(B) 若公司生產20單位，應購買.

$TC_A = 10q+40 = 10\times 20 + 40 = 240$ ✓

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

(C) 若公司生產40單位，應購買.

$TC_A = 10q+40 = 10\times 40 + 40 = 440$

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

(D) 在產量低於多少時，應購買A.

$TC_A < TC_B$

$10q + 40 < 8q + 100$

$2q < 60$

$q < 30$