短期成本

$STC = TVC + TFC = wL + rK$　　$TFC = rK$

$STC = SHC + SVC$　　$TVC = wL$

$= rk + wL$

平均

$SAC = SAFC + SAVC$

$SMC = \frac{dSTC}{dq} = \frac{dSVC}{dq}$

Week 5 作業

9, 技術 A：$q = Min\{L/2, K/4\}$　技術 B：$q = Min\{L/4, K/2\}$

$w=1$　$r=2$　　標利金 = A：40，B：100

A, 兩種技術成本函數

$q = \frac{L}{2}$　　$q = \frac{K}{4}$　　$1(2q) + 2(4q) = 10q$

$L = 2q$　　$K = 4q$　　$TC_A = 10q + 40$

$q = \frac{L}{4}$　　$q = \frac{K}{2}$　　$1(4q) + 2(2q) = 8q$

$L = 4q$　　$K = 2q$　　$TC_B = 8q + 100$

B, if $q=20$，哪個成本低

$TC_A = 240$　　$TC_B = 260$

TC_A ✗

C, if $q=40$，哪個成本低

$TC_A = 440$　　$TC_B = 420$

TC_B ✗

D, $q < ?$　$= TC_A$

$10q + 40 = 8q + 100$

$2q = 60$

$q = 30$　　$q < 30$ ✗

短期成本

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

A, 短期成本函数，变动成本函数，边际成本函数

$(L劳)^2 = \left(\frac{q}{10K生}\right)^2$ $L = \frac{q^2}{100k}$

STC $= 10\left(\frac{q^2}{100k}\right) + 10K$

$= \frac{q^2}{10k} + 10k$ ✱

SAC $= \frac{\frac{q^2}{10k}}{q} + \frac{10k}{q}$

$= \frac{q}{10k} + \frac{10k}{q}$ ✱

MC $= \frac{q^2}{10k} + 10k$

$= 2\frac{q}{10k} + 10$

$= \frac{q}{5k} + 10$ ✱

B, 成本函数

$\frac{dSTC}{dk} = -\frac{q^2}{10k^2} + 10 = 0$ $k = \frac{q}{10}$ $\frac{q^2}{10\left(\frac{q}{10}\right)} + 10\frac{q}{10}$

$= 2q$

12, 产量 $= 20$ AC与AVC差 10 (AFC) $AFC = \frac{TC}{q}$ $\frac{APC = 10}{20}$

产量 $= 40$ AC与AVC差 ?

$q=20$ $AC - AVC = 10$

$q=40$ $AC - AVC = ?$ $AFC = \frac{FC}{q}$

$FC = 20 \times 10 = 200$

$\frac{200}{40} = 5$ ✱

13, $MC = 10q$ $FC = 100$ $q=10$ $TC = ?$

$TC = VC + FC$

$\int_0^{10} 10q\,dq$

$5q^2\Big|_0^{10} = 500$

$500 + 100$

$= 600$ ✱