ECON 2020E
Intermediate Microeconomics
Instructor: Wen Ci

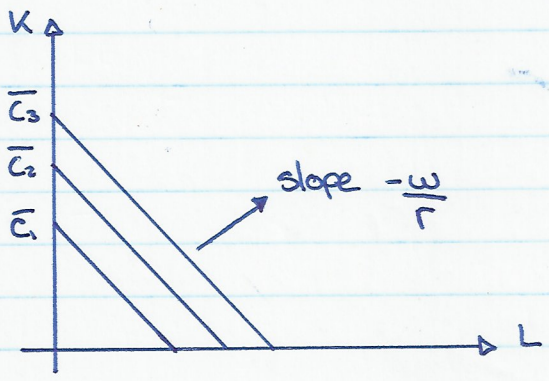
Midterm 1.

Question 1

1) B
2) D
3) B
4) B
5) B
6) C
7) B
8) B

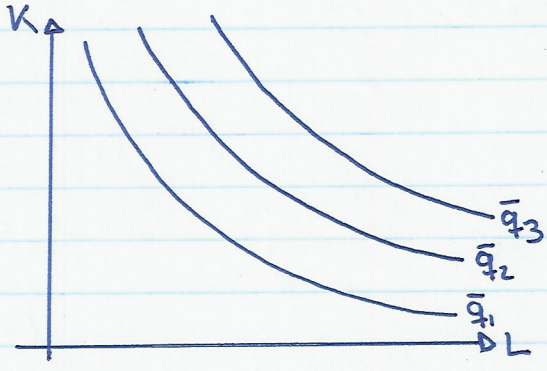
Question 2

1) Isocost curves

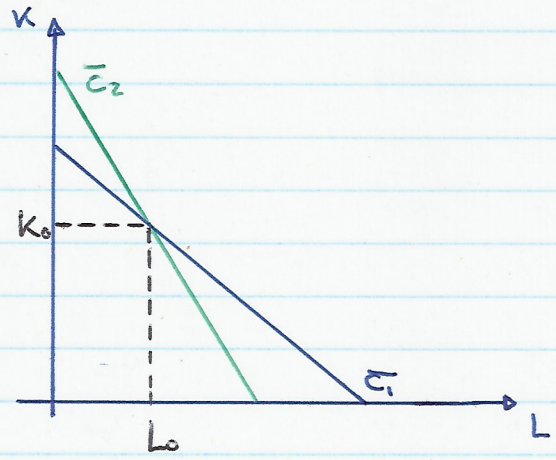


$\bar{C} = wL + rK$

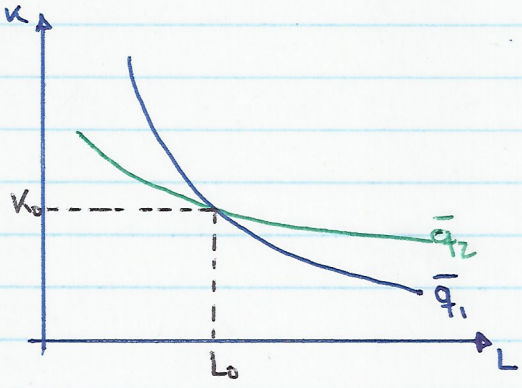
Isoquant curves



Neither isocost curves or isoquants can cross



If two isocosts $\bar{C}_1$ and $\bar{C}_2$ cross as drawn, then the input combination (L_0, K_0) at point A will incur the cost $\bar{C}_1$ as well as $\bar{C}_2$, which implies that $\bar{C}_1 = \bar{C}_2$. So isocost curves do not cross.



Similarly, L_0 & K_0 cannot produce two different levels of output when production is efficient. Therefore, isoquants do not cross.

2) $q = 7L^2 - \frac{2}{3}L^3$

$MP_L = 14L - 2L^2$

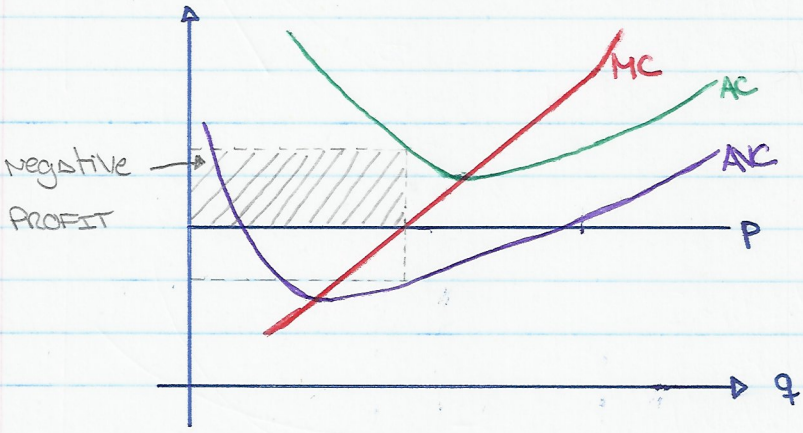
$\frac{dMP_L}{dL} = 14 - 4L \Rightarrow \frac{dMP_L}{dL} < 0$ when $L > \frac{14}{4}$

Diminishing returns begin when $\frac{dMP_L}{dL} < 0$, which occurs when $L > \frac{14}{4}$

Hilroy

3) i) FALSE. When MR = MC profit is maximized, but this does not necessarily imply that the maximized profit is positive.

The graph below is simply a reminder. It was not necessary to get full marks



(course notes 4 slide 18)

ii) FALSE. In the short run, the firm will continue to produce as long as it can cover variable costs, despite an overall negative profit (loss).

In the long run, the firm will shut down if profits are negative

4) $TC = 40 + 7q^2$

Any given firm will produce the quantity where MR = MC.

$$\Rightarrow \quad p = 14q \iff q = \frac{p}{14}$$

Total market supply is $Q = 500q \iff Q = \frac{500p}{14}$

Question 3

1) $C(q) = 10 + 2q + 7q^2$

$p = 44$

a) $\max_q \Pi = pq - 10 - 2q - 7q^2$

FOC $\frac{d\Pi}{dq} = p - 2 - 14q = 0$

Substituting p : $44 - 2 - 14q = 0$

$\iff 14q = 42$

$\iff q^* = 3$

SOC In order for $q^* = 3$ to be a local maximum, $\frac{d^2\Pi}{dq^2} < 0$.

$\frac{d^2\Pi}{dq^2} = -14 < 0$ } The SOC is satisfied

Maximum $\Pi^* = 53$