

Lecture 8 - Production

AFTERNOON

10/18/20

Q1 - GLS Chapter 6 - Q2

total
Q
↓

output due
to last
add'l unit
of input
↓

Q / input
↓

Labor Input	Total Product	Marginal Product	Average Product
0	0	—	—
1	70	70	70
2	135	$135 - 70 = 65$	$135 / 2 = 67.5$
3	$63 \cdot 3 = 189$	$189 - 135 = 54$	$63 = \frac{Q}{L}$
4	$189 + 51 = 240$	51	$240 / 4 = 60$
5	$57 \cdot 5 = 285$	$285 - 240 = 45$	57
6	324	$324 - 285 = 39$	$324 / 6 = 64$

2. GLS - Ch 6 Q 7

7. Suppose that a firm's production function is given by $Q = K^{0.33}L^{0.67}$, where $MP_K = 0.33K^{-0.67}L^{0.67}$ and $MP_L = 0.67K^{0.33}L^{-0.33}$.

- a. As L increases, what happens to the marginal product of labor?

$$MP_L = \frac{2}{3} \frac{K^{1/3}}{L^{1/3}}$$

as $L \uparrow$, $MP_L \downarrow$

2) Ch 6, Q7, cont'd.

- b. As K increases, what happens to the marginal product of labor?
- c. Why would the MP_L change as K changes?
- d. What happens to the marginal product of capital as K increases? As L increases?

$$(b) \quad MP_L = \frac{2}{3} \frac{K^{1/3}}{L^{1/3}}$$

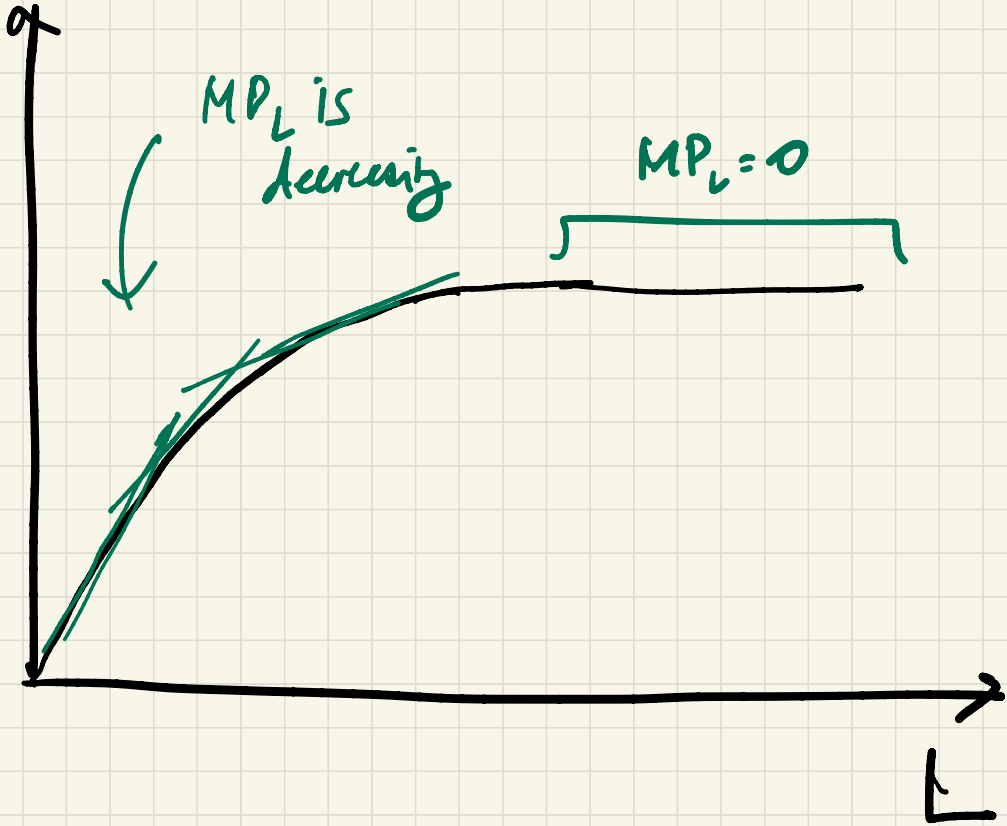
$MP_L \uparrow$ as $K \uparrow$

$$(c) \quad MP_K = \frac{1}{3} \frac{L^{2/3}}{K^{2/3}}$$

As $K \uparrow$, $MP_K \downarrow$

As $L \uparrow$, $MP_K \uparrow$

Q



MP_L is decreasing

$MP_L = 0$

Q3. GLS. Ch6. Q6

	0	Labor (L)					
		1	2	3	4	5	6
Capital (K)	1	100	132	155	174	190	205
	2	152	200	235	264	289	310
	3	193	255	300	337	368	396
	4	230	303	357	400	437	470
	5	263	347	408	457	500	538
	6	293	387	455	510	558	600

$$MP_L = \frac{2}{3} K^{1/3} L^{-2/3}$$

$$= \frac{2}{3} \frac{K^{2/3}}{L^{1/3}}$$