

Nov 5, 2019 ①

Last time - Short-run Production

- LR Production : $Q = Q(K, L)$
- SR " : $Q = Q(\bar{K}, L)$, $\bar{K}$ is fixed.

• Total product : $TP = Q = Q(L)$

→ Average product :

$$AP = \frac{Q}{L}$$

(ie. per-unit output).

→ Marginal product :

$$MP = \frac{\Delta Q}{\Delta L}$$

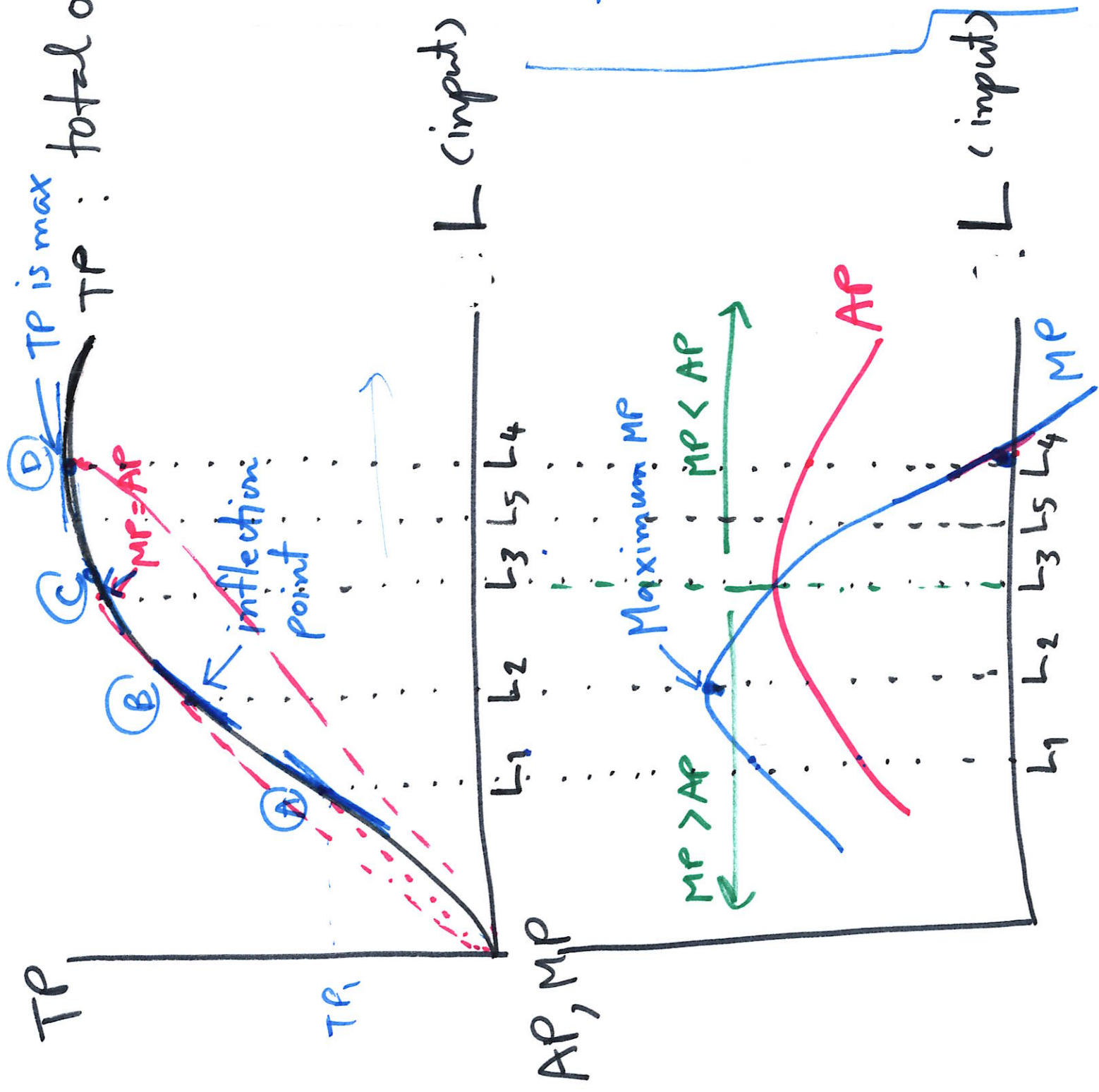
(ie. rate of change of output)

TP is max
 TP : total output. = $Q = f(L)$

$$AP = \frac{Q}{L}$$

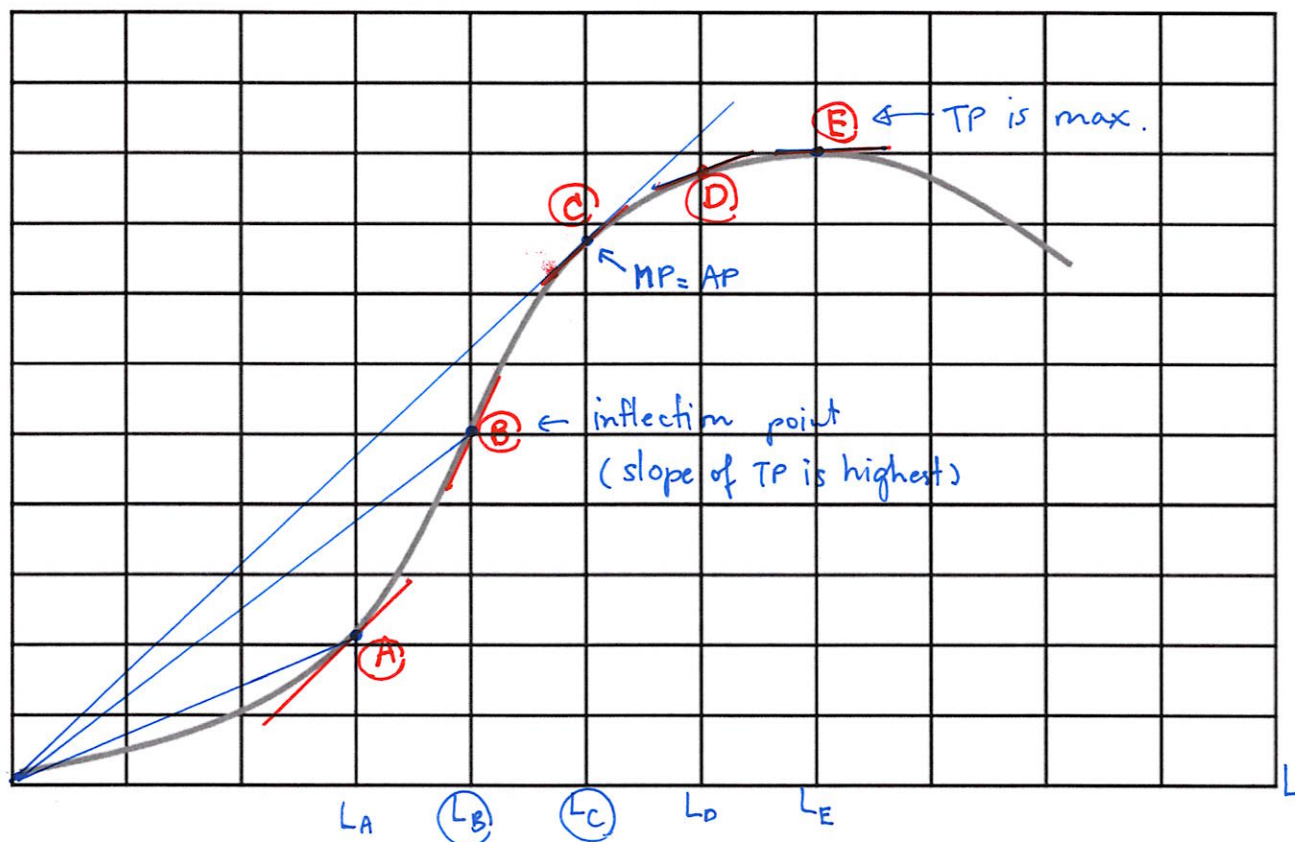
$$MP = \frac{\Delta Q}{\Delta L}$$

(slope of TP)

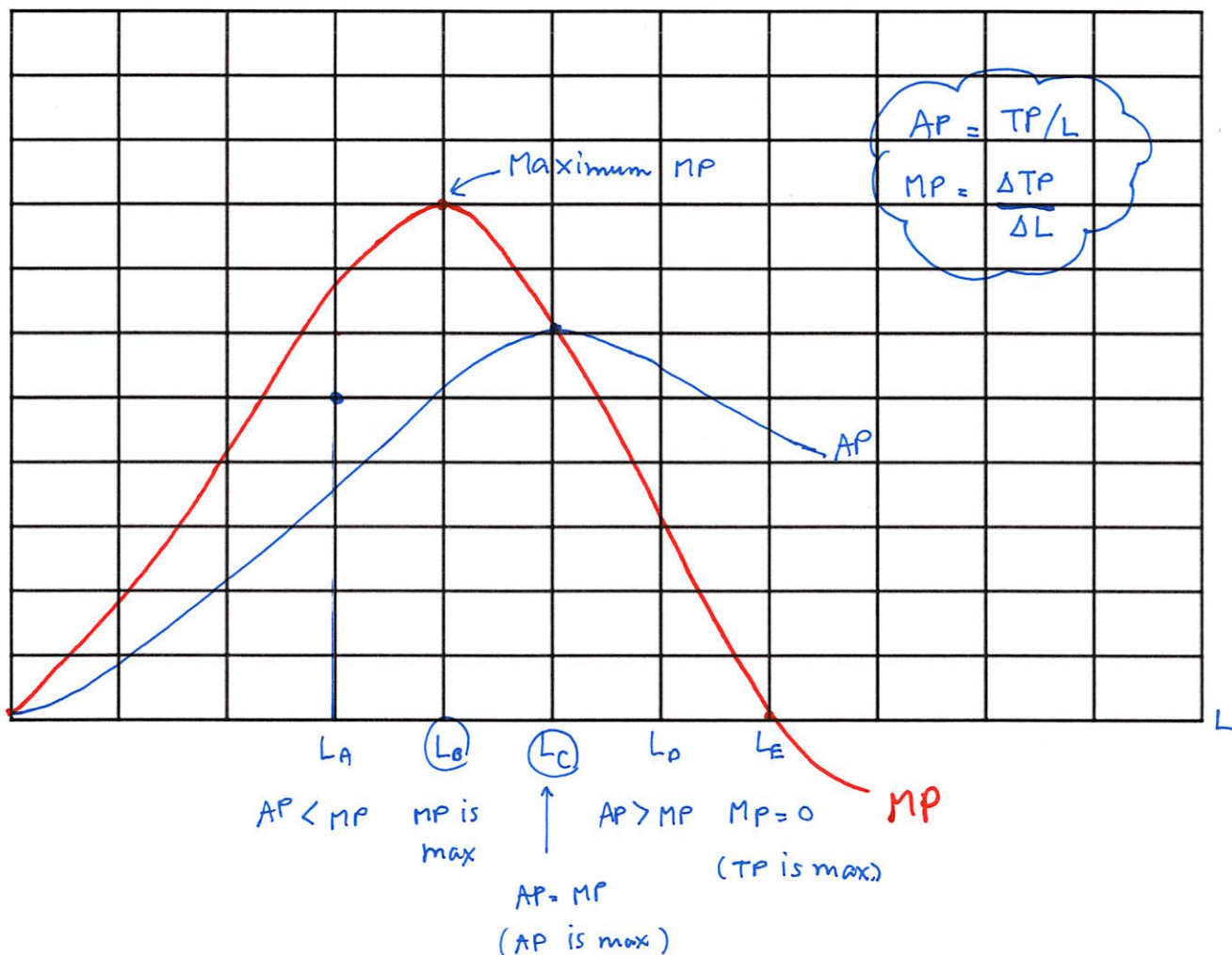


L	MP, AP
L_1	$MP > AP$
L_2	$MP > AP$
L_3	$MP = AP$
L_4	$MP = 0$
L_5	$MP < AP$

TP



AP, MP



$$TC(Q) = TFC(Q) + TVC(Q)$$

$$= \text{Rent} + \underline{VC} \times Q$$

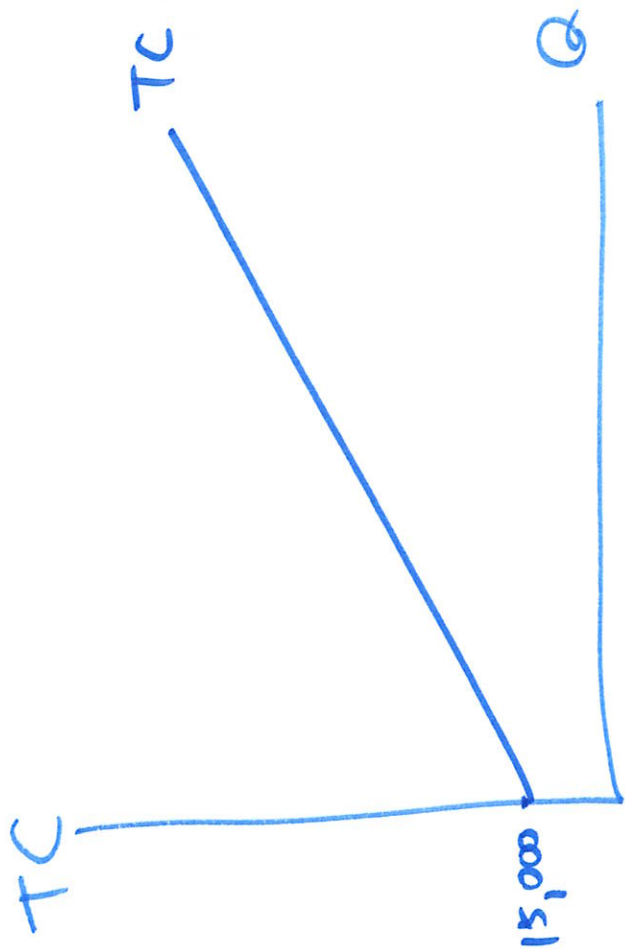
Say, you sell coffee, pay \$15,000/mo,
cost per ~~cup~~ cup is \$20.

$$TC(Q) = 15,000 + 20Q$$

$$ATC(Q) = \frac{TC}{Q} = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$ATC = \frac{15,000}{Q} + \frac{20Q}{Q}$$

$$ATC = \frac{15,000}{Q} + 20$$



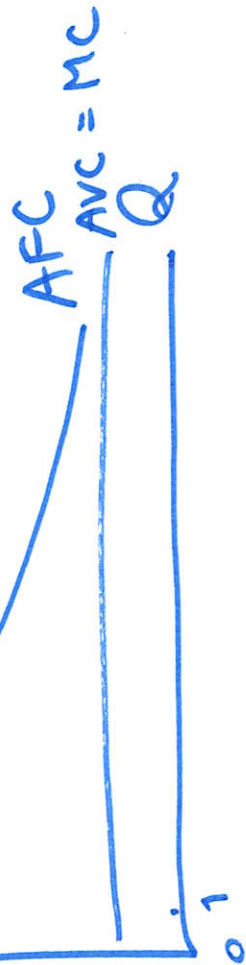
$$AFC = \frac{15,000}{Q}$$

$$AVC = \frac{20Q}{Q} = 20$$

ATC, AFC, AVC

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{d(TC)}{dQ}$$

$$MC(0) = \frac{d}{dQ}(15,000 + 20Q) = 20$$



* AVC needs not be the same as MC.

$$TC = TVC + TFC$$

$$ATC = \frac{TVC}{Q} + \frac{TFC}{Q}$$

$$= AVC + AFC$$

$$MC = \frac{\Delta TC}{\Delta Q}$$

= slope of cost fⁿ.

