Assignment 2

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1.a) • $MRTS = \frac{\Delta K}{\Delta L} = \frac{MP_L}{MP_K} = \frac{6}{8} = 0.75$ #

∴ To produce the same amount of output, firm needs to sacrifice 0.75 units of capital to get 1 unit of labor #

• cost - minimization condition is $MRTS = MRMS$

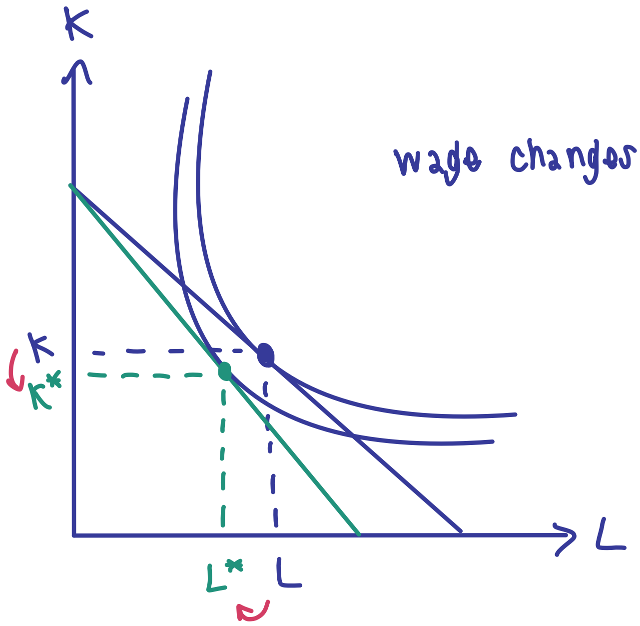
$$\frac{MP_L}{MP_K} = \frac{w}{r}$$

$$\frac{MP_L}{w} = \frac{MP_K}{r}$$

$$\frac{6}{3} = \frac{8}{r}$$

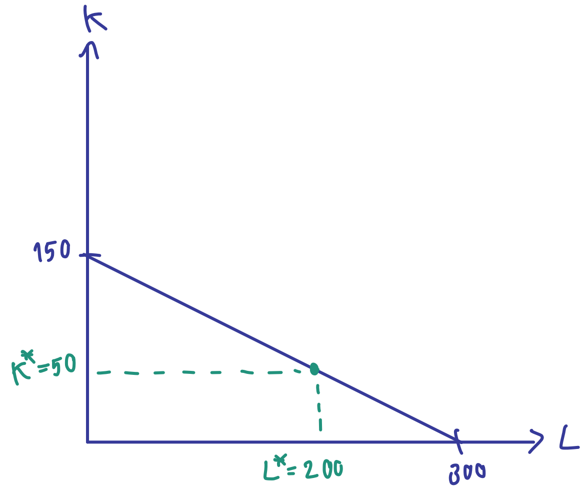
$$r = 4$$ #

1.b)



wage changes $3 \rightarrow 4$

2.a)



$TC = LW + Kr$

$= 200(10) + 50(20)$

$= 3000$

• find intercept

$K=0 \rightarrow 3000 = 10L \rightarrow L = 300$

$L = 0 \rightarrow 3000 = 20K \rightarrow K = 150$

• cost-minimization : MRTS = MRMS

$\left|\frac{\Delta K}{\Delta L}\right| = \frac{w}{r}$

$\left|\frac{-150}{300}\right| = \frac{10}{20} = \frac{1}{2}$

∴ The optimal choice to minimize the cost and keep the level of output, firm sacrifice 1 K and gain 2 L

$q(K^*, L^*) = q(50, 200)$

2.b)

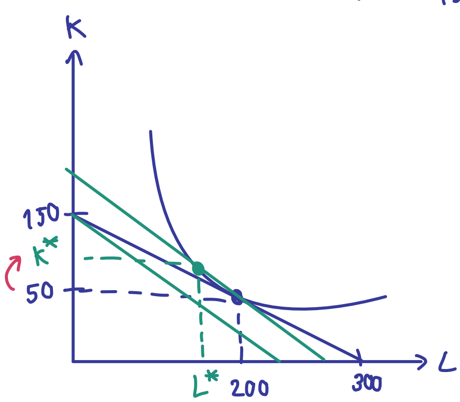
$\frac{MP_L}{MP_K} = \frac{w}{r}$

$MP_L = \frac{10}{20} \cdot 8$

$= 4 \times 4$

∴ MP_L of 200^{th} labor = 16

2.c) W increase $10 \rightarrow 15$



$3000 = 15L + 20K$

when $L = 0$: $3000 = 20K$; $K = 150$

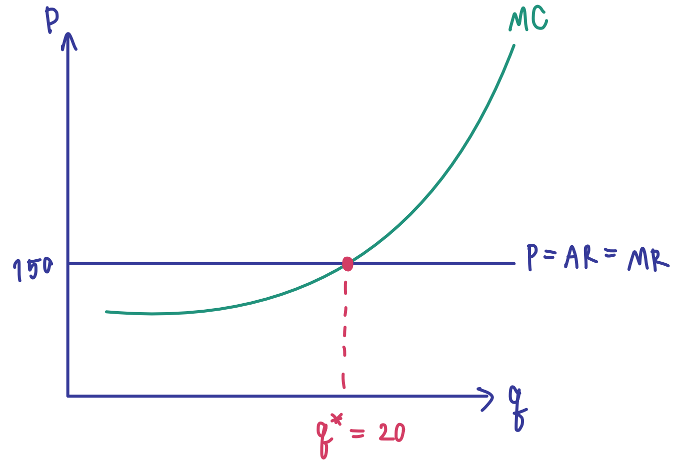
$K = 0$: $3000 = 15L$; $L = 200$

∴ using less labor due to w↑ but more capital, the productino becomes more capital-intensive

2.d) In short-run, there is at least 1 factor is fixed as firm take time to expand.

In long-run, all factors are variable and can be adjusted.

3.a)



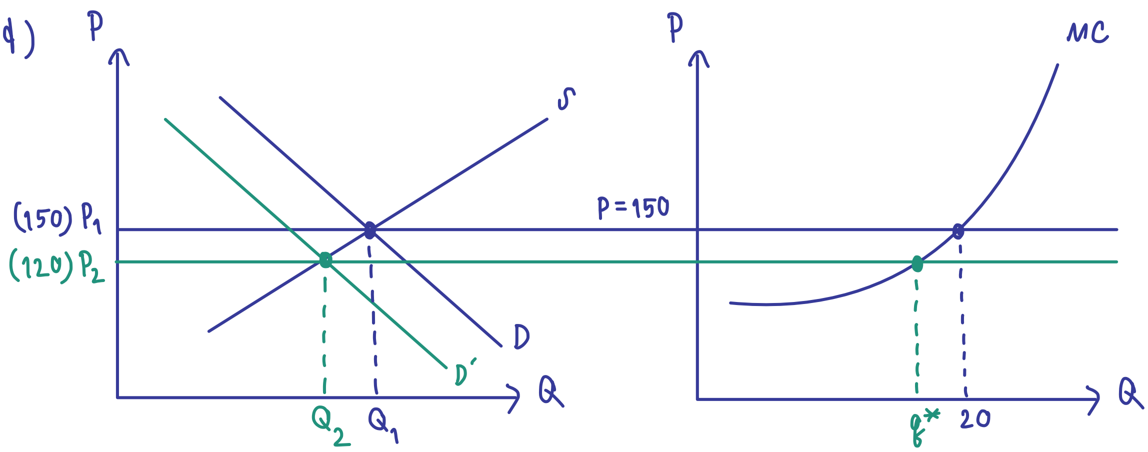
∴ profit maximization condition : MC = MR

3.b)

AVC = ATC − AFC = 180 − 60 = 120 baht ※	TR = P · q = 150 · 20 = 3,000 baht ※	TC = ATC · q = 180 · 20 = 3,600 baht ※	Profit = TR − TC = 3,000 − 3,600 = − 600 (lost) ※

3.c) Yes, the firm can still stay in the short-run market althoug they facing loss. This is because Price still more than average cost (P > AVC). Firms can compesate the fixed cost by using the difference between P and AVC. ※

3.d)



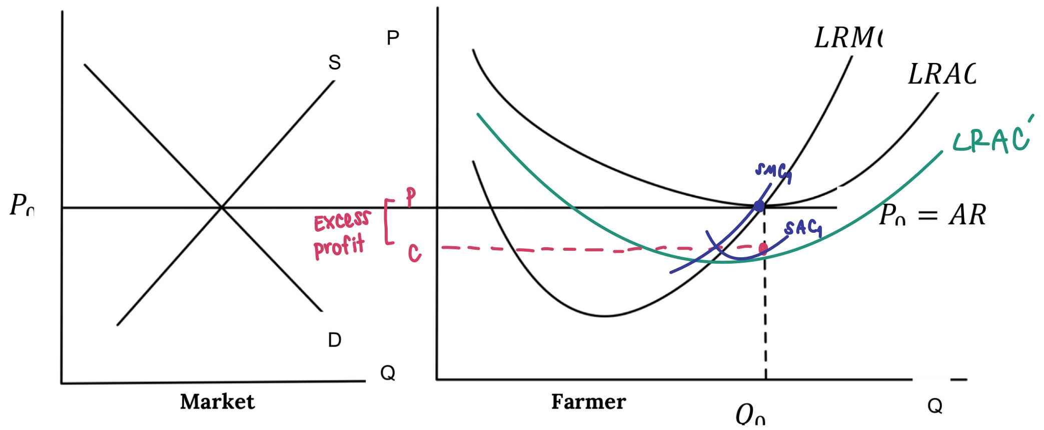
when price market drops to 120, the equilibrium quantity and profit will drop.

so P = AVC, wheter keep producing at q* or stop are indifferent. ※

4.a) subsidy will decrease TC, so this make LRAC drops.

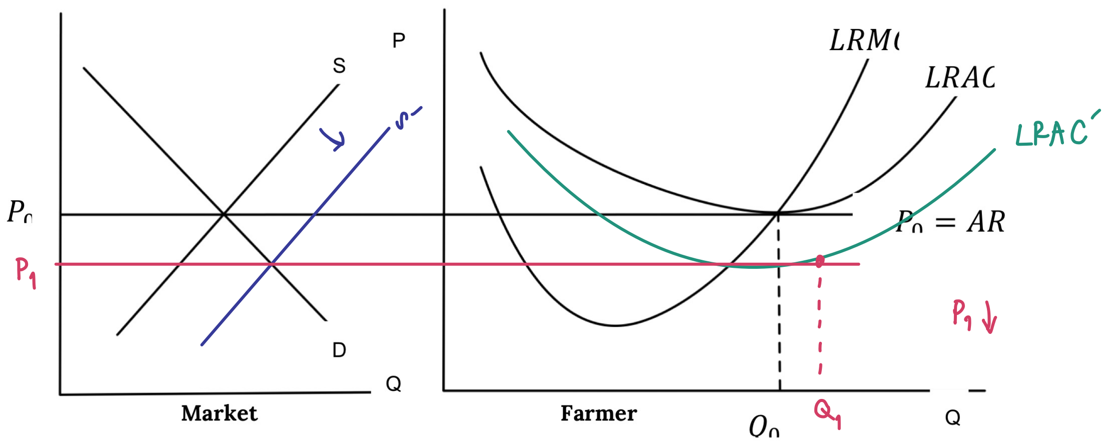
Because farmer is a price taker in the perfect competition, the competitve price and q^* remain constant. So, LRMC has no chance as there is no change in q.

4.b) No, since the profit maximization is when $P = LRMC$. Here both P and LRMC do not change, the optimal quantity to maximize profit will be the same (Q_0)



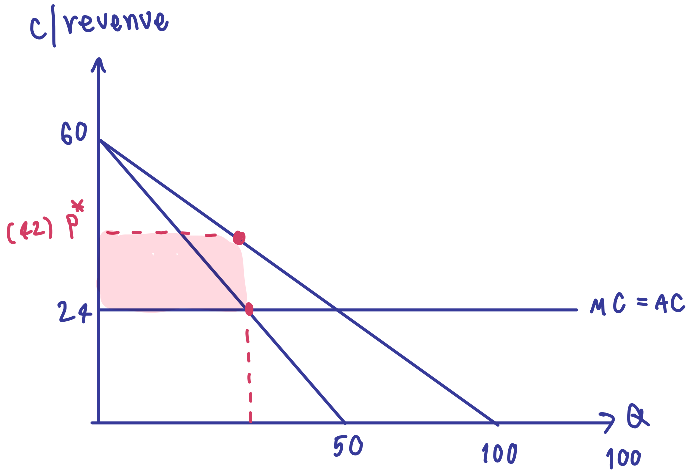
$P > C$ ther is excess profit

4.c) In long-run, excess profit will attract new farmers to market, so supply increase.



when $S\uparrow \rightarrow P\downarrow \rightarrow q^*\uparrow$

5.a) When D is linear, MR is 2 times steeper



MR : $P = 60 - 1.2\,Q$

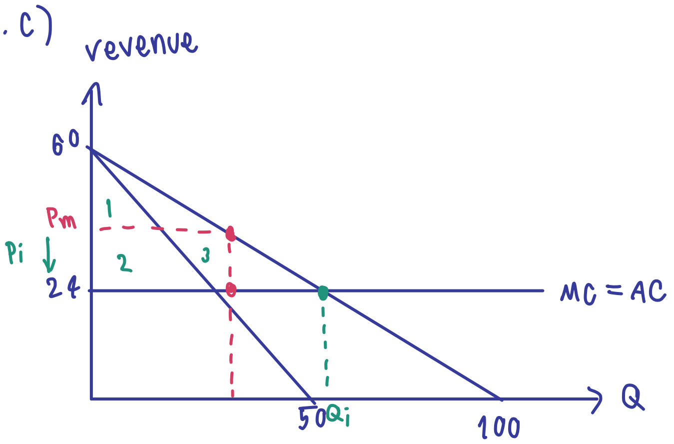
5.b) Profit - maximizing condition

$$MR = MC$$
$$60 - 1.2(Q) = 24$$
$$Q^* = 30 \text{ units}$$

$$P = 60 - 0.6(30) = 42$$

$\therefore$ Profit $= (P-C)\cdot Q = (42-24)$
$= 540$ MB

5.c)



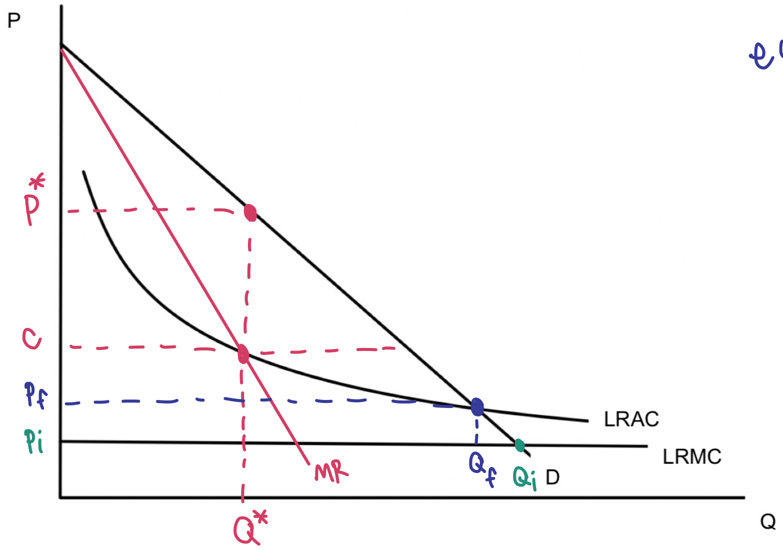
- Ideal price : $P = MC$
  - quantity ↑ $Q_m \rightarrow Q_i$

- before intervention
  - CS = 1
  - PS = 2 (π)
  - DWL = 3

- after intervention
  - CS = 1 + 2 + 3
  - PS = -
  - DWL = -

$\therefore$ Intervention prevents HL from taking the advantages from consumer and removes the DWL.

6.a)



equilibrium Q^* : MR = LRMC

CS = 1

DWL = 3

producer's profit = 2

6.b) Lerner's index → $i = \frac{P - MC}{P} = \frac{50 - 10}{50} = 0.8$ ※

6.c) Ideal price → P = MC = 10\$ ※ (at P_i , firm facing loss due to P < LRAC)

6.d) Fair price → P = LRAC ※ (at P_f no DWL as firm is at normal profit)