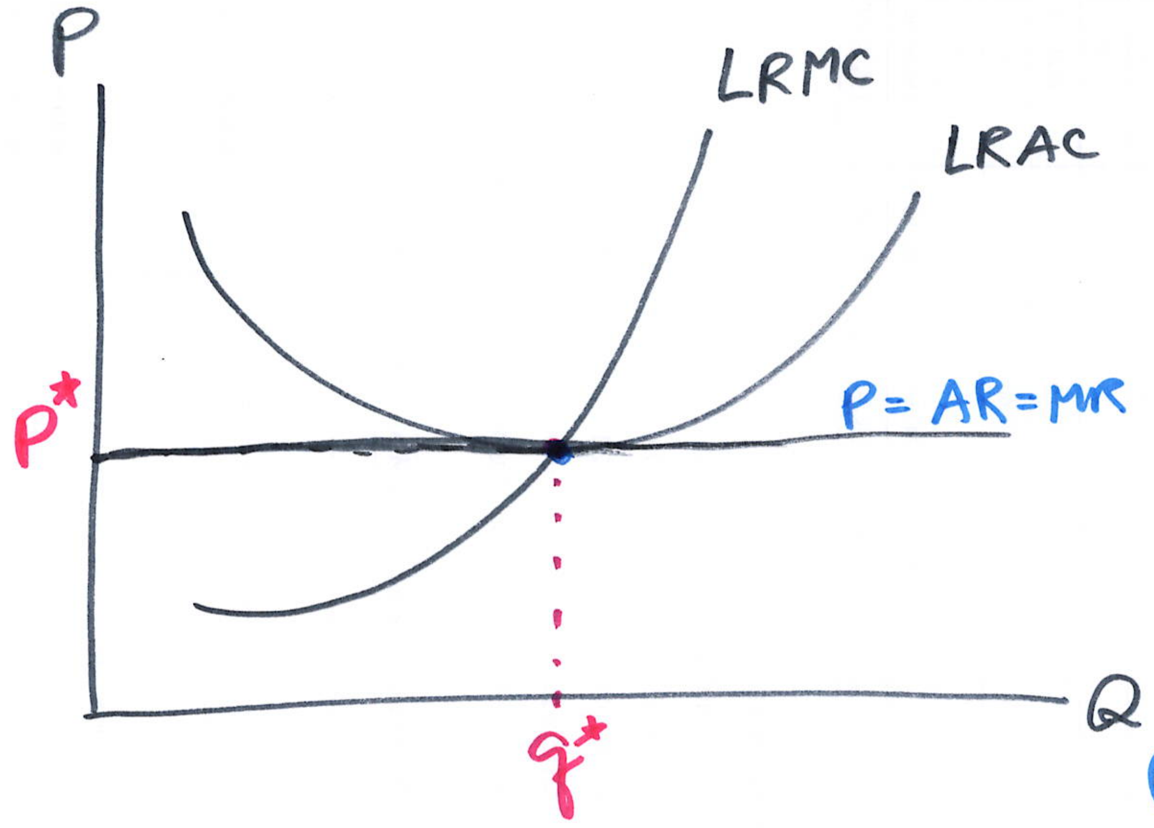
Review : Long-run Equilibrium for Competitive Firm.



Eqm condition

$P = MC$

Long-run Eqm :

1. $P^* = LRMC$

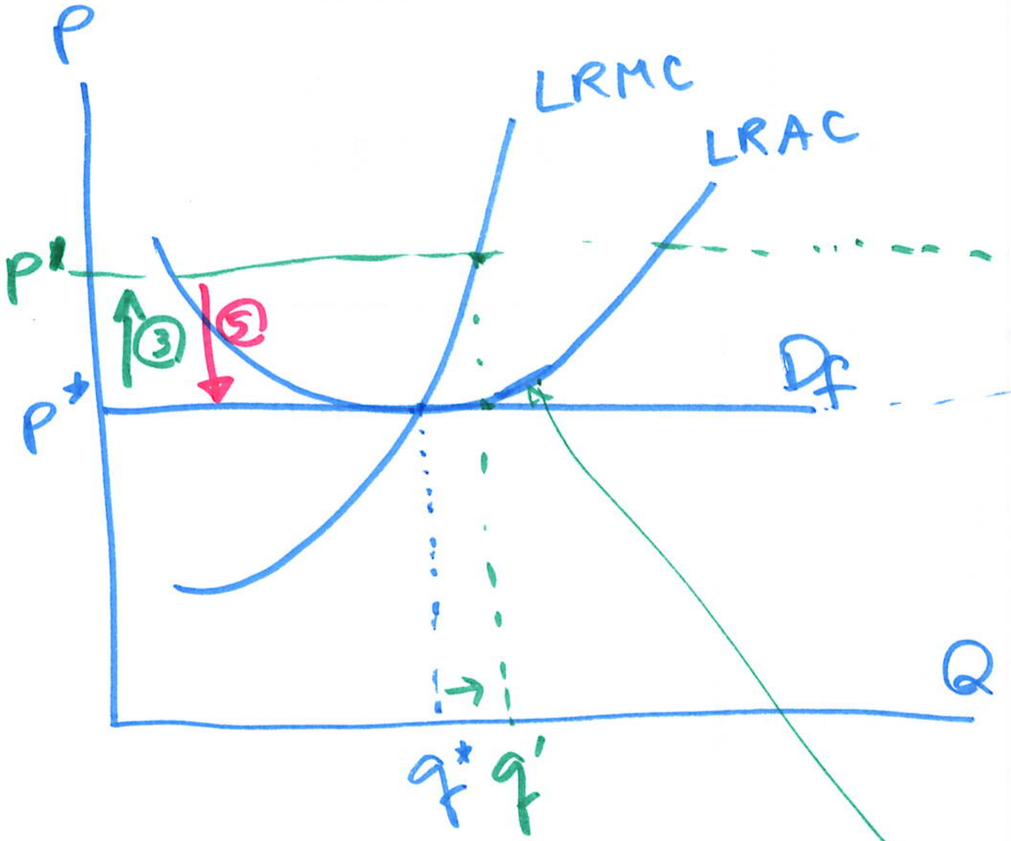
   ⇒ Allocative Efficiency ($MR = MC$)

2. $P^* = \text{Min } LRAC$

   ⇒ Productive Efficiency.

Suppose demand increases.

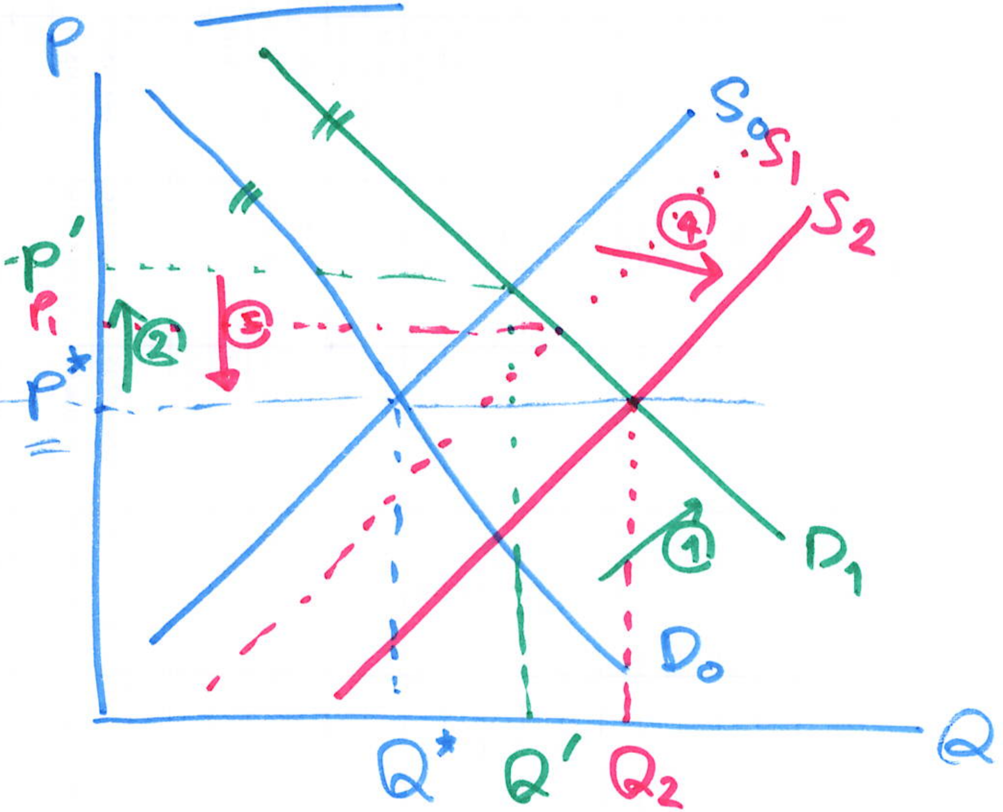
Competitive Firm



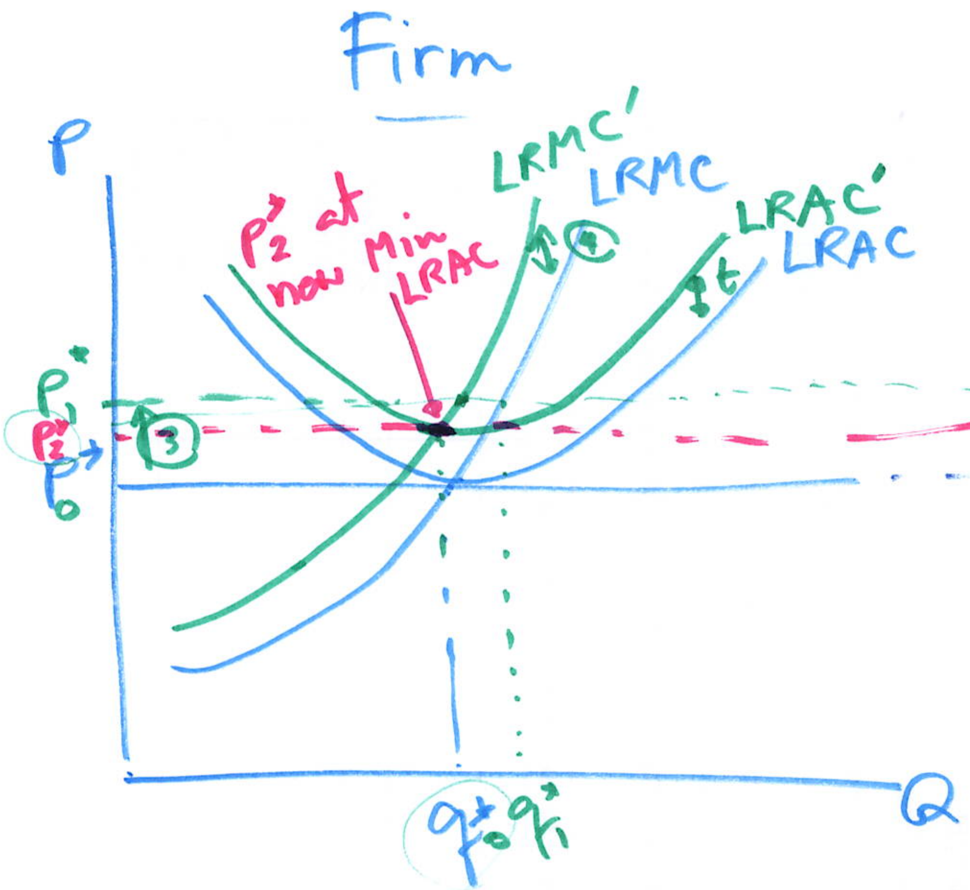
⇒ +ve Profit

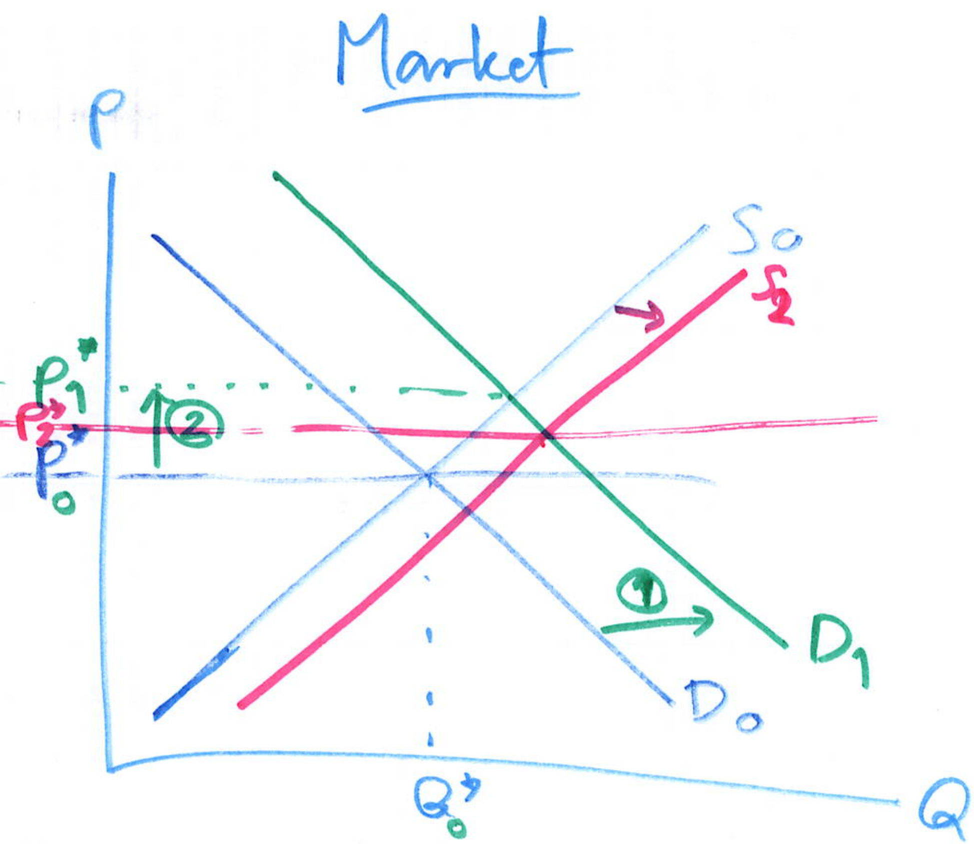
⇒ New firms enter.

Market



Assume cost is constant.





v. Cost increases. (tax/unit is imposed)

Suppose demand increases and cost increases. (firm's AC ↑).

Monopoly $\rightarrow$ Price setter.

$P = P(Q)$: Demand curve.; eg. $P = 6 - Q$

$$TR(Q) = P(Q) \times Q = (6-Q) \times Q = 6Q - Q^2 = TR(Q)$$

$$AR(Q) = \frac{TR(Q)}{Q} = \frac{6Q - Q^2}{Q} = 6 - Q = P(Q)$$

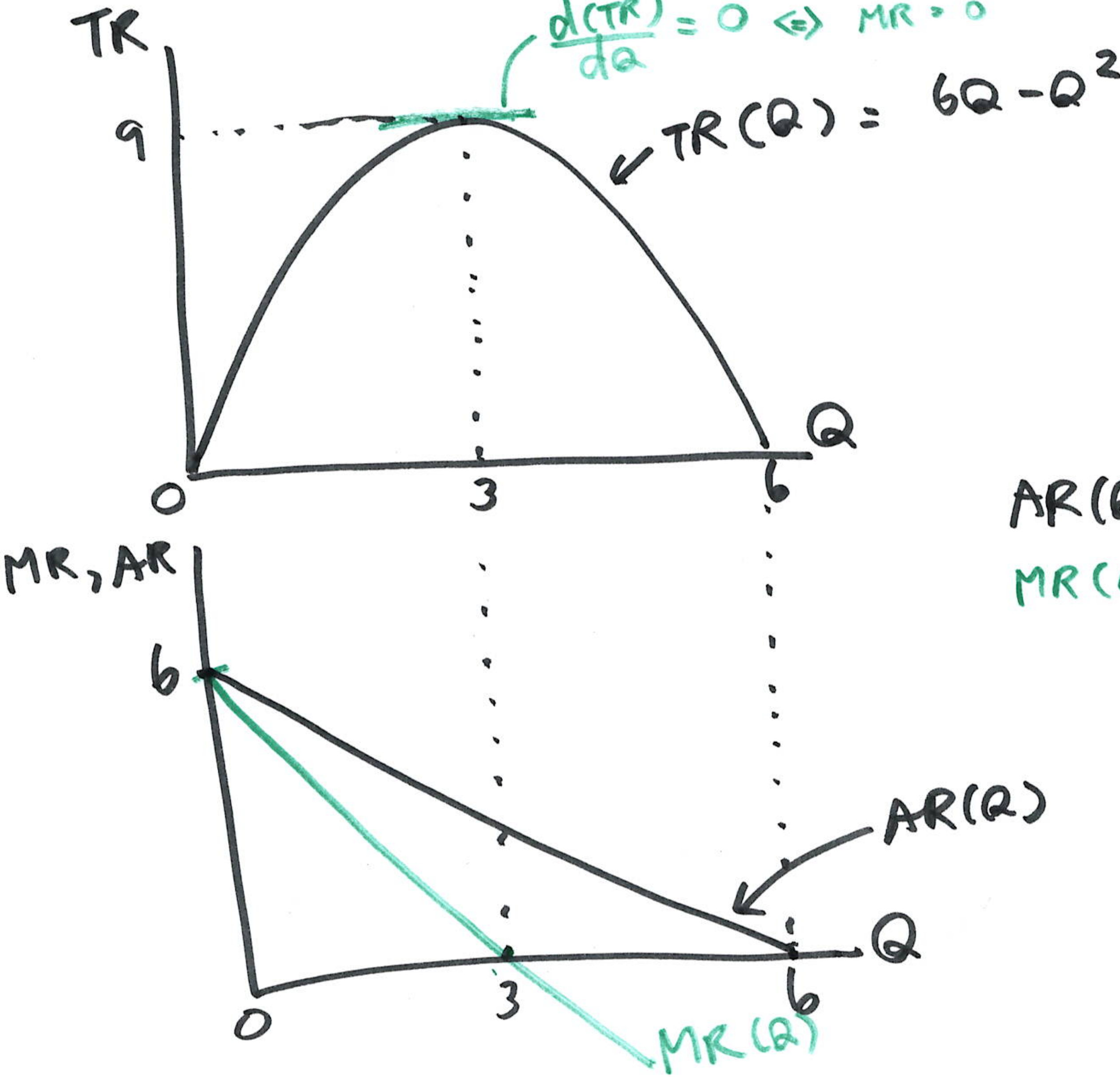
$$MR(Q) = \frac{\Delta TR(Q)}{\Delta Q} = \frac{d[TR(Q)]}{dQ} = \frac{d(6Q - Q^2)}{dQ}$$

$$= 6 - 2Q$$

$\therefore \quad P(Q) \neq MR(Q)$

Given $P(Q) = 6 - Q$

$\Rightarrow$ $TR = 6Q - Q^2$; $AR = 6 - Q$; $MR = 6 - 2Q$



$AR(Q) = 6 - Q$

$MR(Q) = 6 - 2Q$

<u>Firm's Objective</u>: $\max_{Q} \pi(Q) = TR(Q) - TC(Q)$

π is maximum when $\frac{d\pi}{dQ} = 0$ (Note. $\frac{\Delta \pi}{\Delta Q} \approx \frac{d\pi}{dQ}$)

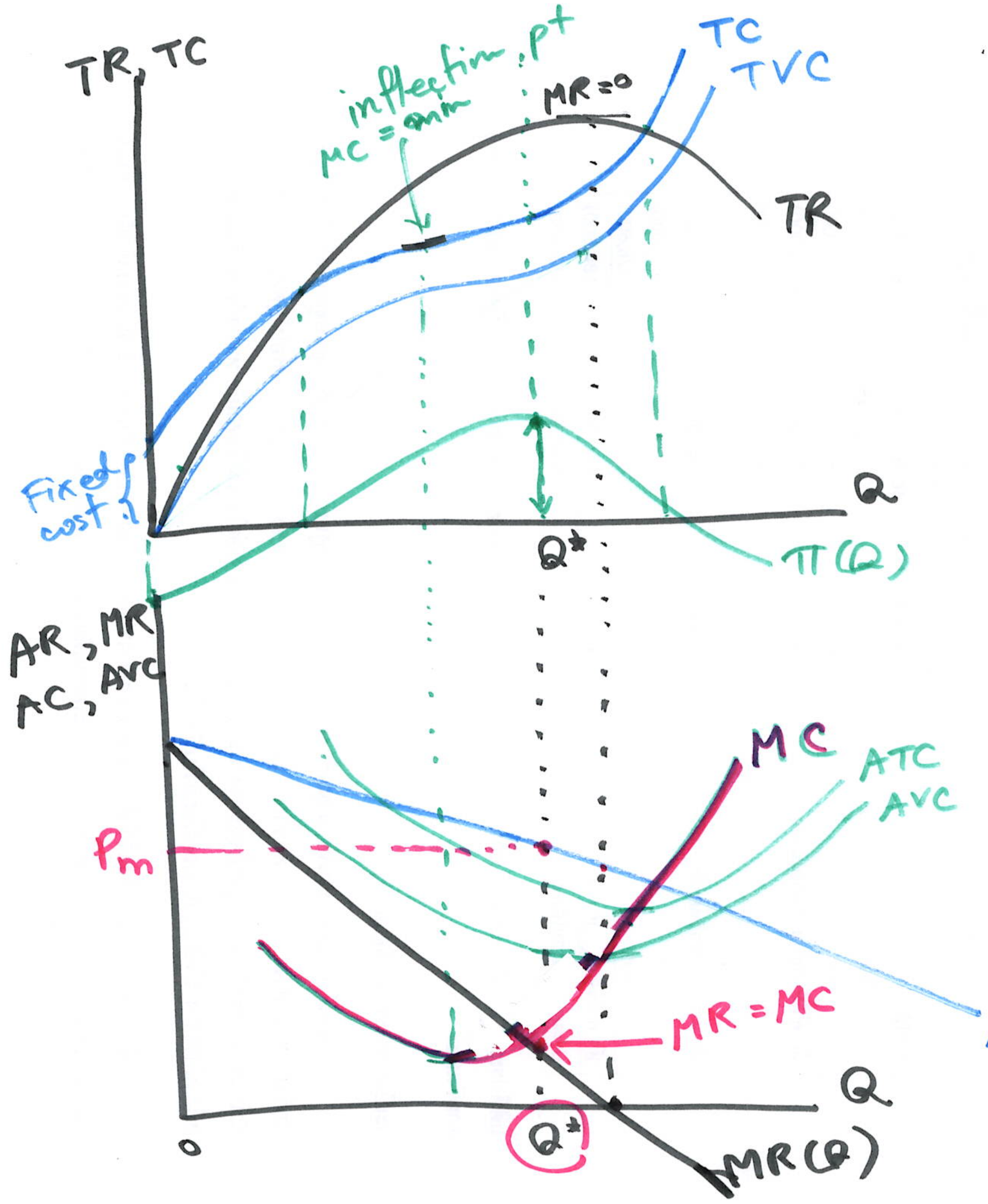
$$\frac{d\pi}{dQ} = 0 \iff \frac{d}{dQ}\left[TR(Q) - TC(Q)\right] = 0$$

$$\frac{d(TR)}{dQ} - \frac{d(TC)}{dQ} = 0$$

$$MR(Q) - MC(Q) = 0$$

$$\iff \boxed{MR(Q) = MC(Q)}$$

Necessary cond^{n} for π-max.



$\pi(Q) = TR(Q) - TC(Q)$

Max π is at

$MR(Q) = MC(Q)$

$\rightarrow Q^*$

Monopoly Equilibrium (SR)