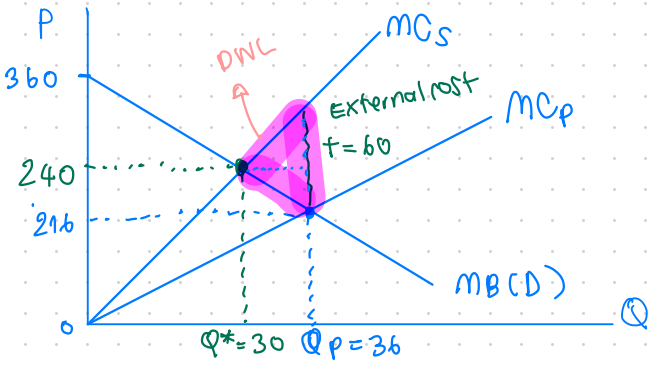
Assignment 2 – Q1 answers

Suppose $D\ (WTP) \sim MB_p = 360 - 4Q$

$MC_p = 6Q$

Marginal damage $(MD) = 2Q$
(external cost)



a) The social optimal

$MC_S = MC_p + MD$

$P = MB = MC_S$

$360 - 4Q = 6Q + 2Q$

$Q^* = 30$ //, $P^* = 240$ //

b) The private optimal (inefficient allocation)

$MB = MC_p$

$360 - 4Q = 6Q$

$Q_p = 36$ //, $P_p = 360 - 4(36)$

$= 216$ //

c) Tax level

$MB = MC_S$

$360 - 4Q^* = 6Q^* + t$

$240 = 180 + t$

$t = 60$ //

d) DWL

$= \frac{1}{2} \times 6 \times 60$

$= 180$ //

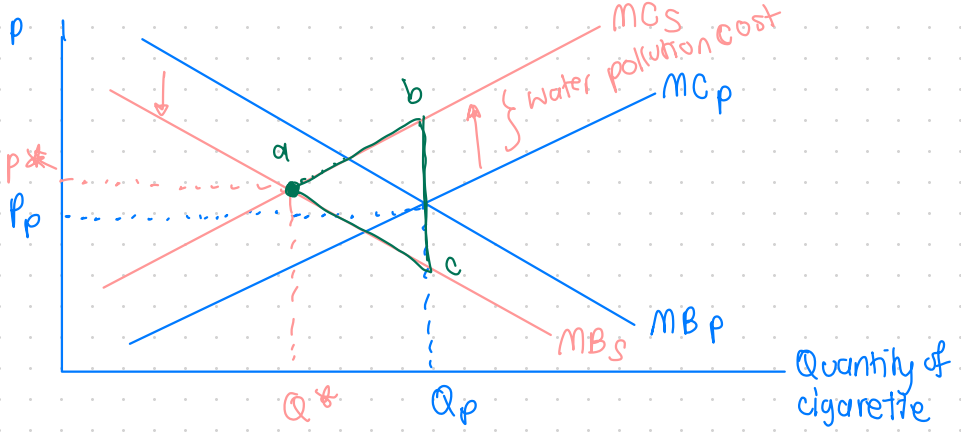
Question 2 a) At private optimal (P_p, Q_p) ⇒ inefficiency arises when firms & consumers do not consider externality effects

⇓

water pollution → MC_S ↑

health risks → MB_S ↓

At social optimal level (P^*, Q^*)



overproduction/inefficient allocation → cause DWL area (abc)

b) i) Government can impose tax ⇄ Production tax on cigarette production / Consumption tax on cigarette use } shift both MC & MB to MC_S & MB_S

ii) Put a cap or restriction on production at Q^* / set a quota at Q^*