Question 1:

Suppose that the demand curve derived from marginal benefit associated with a consumption of chocolate is 360 – 4Q and the marginal cost of chocolate production is 6Q. The marginal damage from pollutions generated by chocolate production is 2Q

a) Find the social optimum or efficient production level (P*, Q*)

b) Find the private equilibrium price and quantity when external costs could be ignored by firms

c) What tax level should be set to achieve the efficient/social optimal

d) Calculate deadweight loss from externalities in this case

e) Drawing a graph to illustrate the result from a) to d)

<u>Answer</u> DEMAND: P=360-4Q SUPPLY: MC=6Q Pollution cost=2Q

a) P = MCs

360-4Q = 6Q+2Q

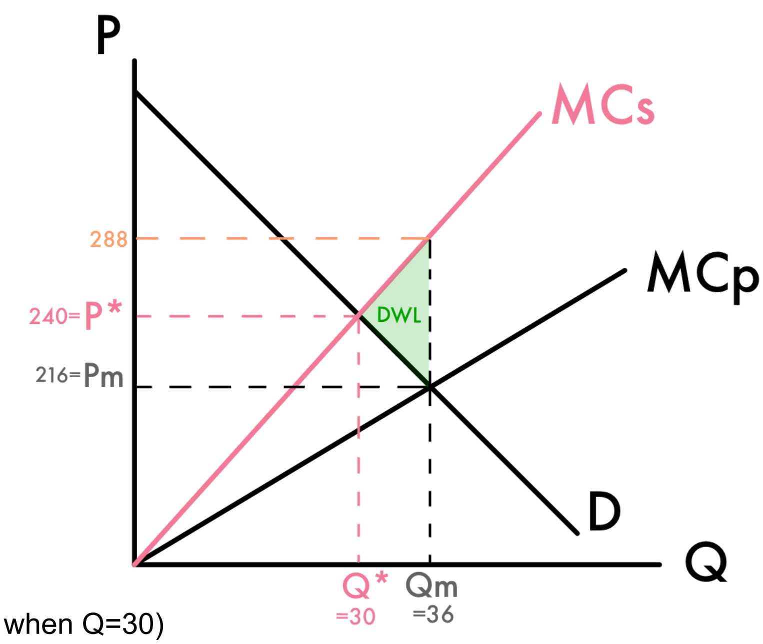
12Q = 360

Q* = 30

>>> P* = 360-4(30)

= 360-120

P* = 240



b) P = MCp

360-4Q = 6Q

10Q = 360

Qm = 36

>>> Pm = 360-4(36)

= 360-144

Pm = 216

c) MCp + TQ = MCs (note MCs=240 when Q=30)

6Q + TQ = 240 ;Q=30

6 + T = 240/30

T = 2

d) DWL = ½ x base x height

= ½ x (36-30) x (288-216)

= 216

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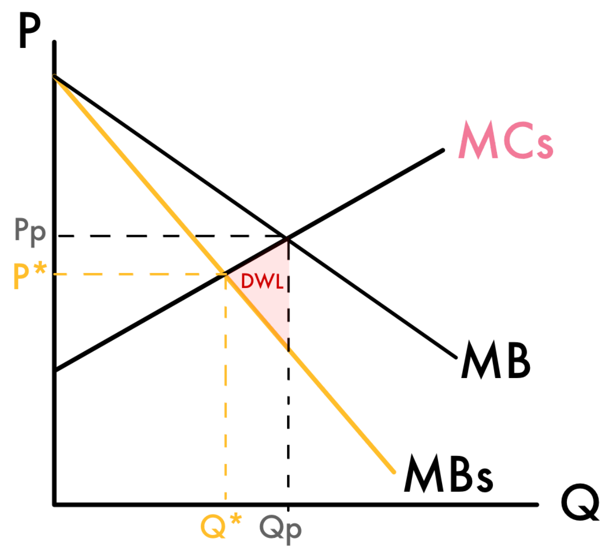
Question 2:
The production of cigarettes increases water pollutions while the consumption of cigarettes can put their neighbors at health risks (Hint: Impact on social marginal benefits as a whole)
a) Explain how externalities in this case create inefficiencies in the cigarette market and draw a graph to illustrate your explanation, including the market equilibrium for cigarettes at i) socially optimal level, P* and Q*; ii) private optimal level (Pp and Qp) when externalities are not internalized by both firms and consumers and; iii) the deadweight loss area.
b) What policies could be considered to reduce deadweight loss in this case and describe the effects of such policies in the cigarette market.

a)



b) Use public resolution through policies and regulations
- Putting a price: since the cigarette is an inelastic goods so the tax will be imposed on the consumer, price will be higher, the marginal benefit (demand) will drop, consumer will consume less. So DWL will be removed as price increases.
- Notifying about product information: Inform how bad the cigarettes impact on pollution and health, discouraging consumers to consume the cigarettes less, making the demand go down.
- Establishing rules:
  - using zone laws like smoking zones and non-smoking zones, increasing awareness to consumers so they will buy less if the place they want to go is not allowed to smoke.
  - Restricted age of 18 years old to reduce demand.

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