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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 $2Q$.

- Find the social optimum or efficient production level (P^* , Q^*)
- Find the private equilibrium price and quantity when external costs could be ignored by firms
- What tax level should be set to achieve the efficient/social optimal
- Calculate deadweight loss from externalities in this case
- Drawing a graph to illustrate the result from a) to d)

$$P = 360 - 4Q$$

$$MC_p = 6Q$$

$$MC_s = 8Q$$

$$1.a.) \quad MC_s = P$$

$$8Q = 360 - 4Q$$

$$Q^* = 30, \quad P^* = 240$$

$$1.c.) \quad T = \text{externality at } Q$$

$$= 2(36)$$

$$= 72$$

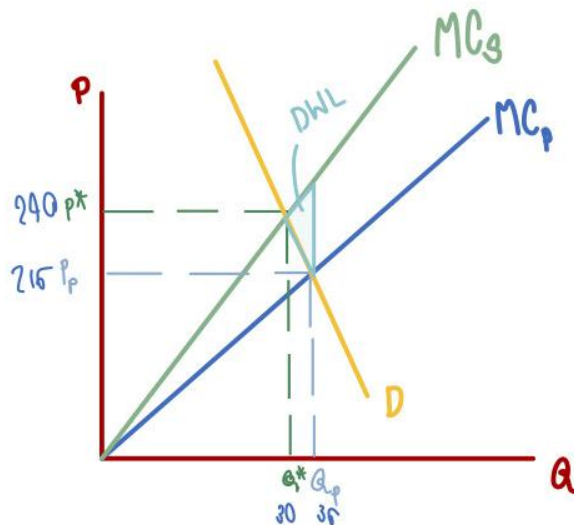
$$1.b.) \quad MC_p = P$$

$$6Q = 360 - 4Q$$

$$Q^* = 36, \quad P^* = 216$$

$$1.d.) \quad DWL (\text{Externality}) = \frac{1}{2} \times 72 \times 6$$

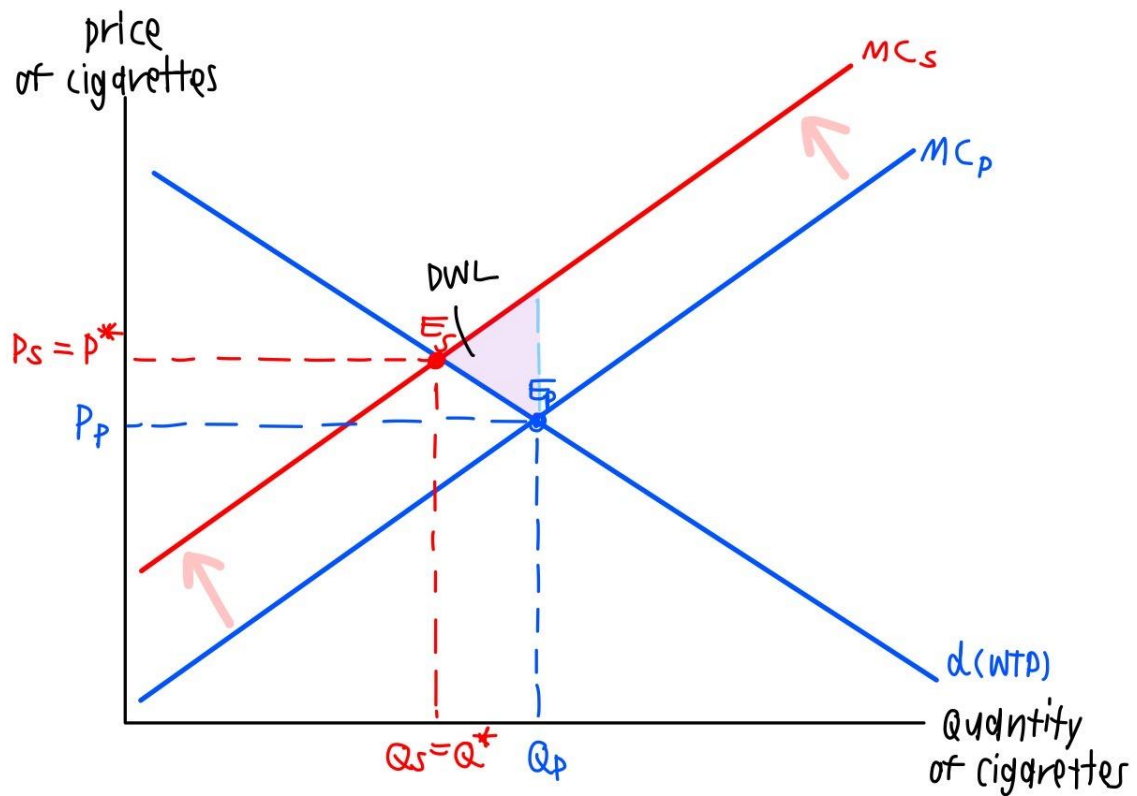
$$= 216$$



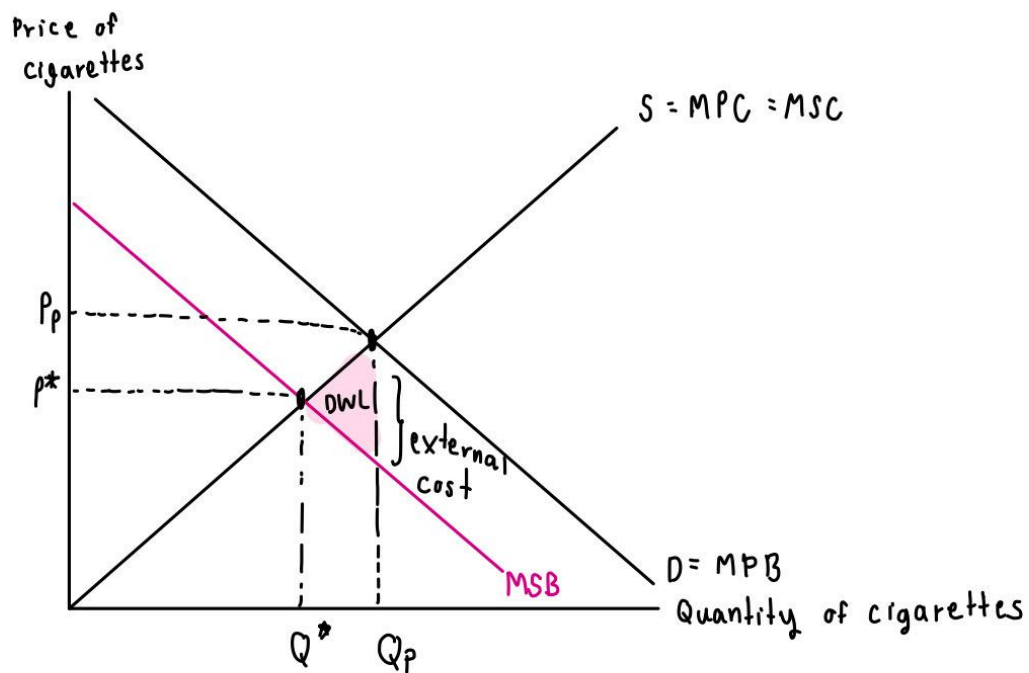
2 a.)

Answer

Since production and consumption both effect on social heath, external cost increased by shifting the supply curve from MC_p to MC_s with a lower quantity (Q^*) but higher price (P^*). If the firm produces at a private optimal level (Q_p , P_p) there will be an overproduction and also create the deadweight loss to society which represents the purple area.



When people consume cigarettes, their consumption is affected by harmful smoke and creates health risks which is also a negative externality to society.
 So, The marginal social benefit of cigarette consumption will be lower than the marginal private benefit, which is allocation inefficiency.



2b) Policies that could be considered to reduce deadweight loss.

1. Increase indirect tax, so the price of cigarettes will be higher, which will make people who smoke think more about their money before they smoke.
2. Restrictions for smoking in public places to reduce the number of smokers in public which will make less smoke in public.
3. Advertise a bad consequence to our health that comes from smoking this way people will be scared of it and it would reduce smoking.