3. The graph below shows the marginal social cost (MSC), marginal private cost (MPC), marginal social benefit (MSB), demand (D), and marginal revenue (MR) curves for a monopoly.
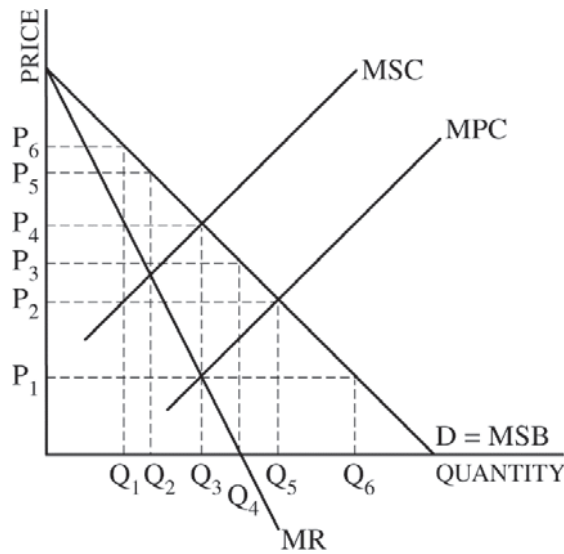
(a) Identify the monopolist's

   (i) profit-maximizing quantity

   (ii) profit-maximizing price

(b) What information in the graph indicates that there is a negative externality?

(c) Identify the socially optimal quantity.

(d) In the case in which the government imposes a per-unit tax equal to the marginal external cost, identify each of the following.

   (i) The dollar value of the tax, using the price labels from the graph

   (ii) The profit-maximizing quantity associated with the tax

(e) Given the monopoly facing the negative externality, would the deadweight loss increase, decrease, or stay the same as a result of imposing the per-unit tax? Explain.

STOP

END OF EXAM

Question 3

7 points (2 + 1 + 1 + 2 + 1)

(a) 2 points:

- One point is earned for correctly identifying the monopolist's profit-maximizing quantity, Q_3.
- One point is earned for correctly identifying the monopolist's profit-maximizing price, P_4.

(b) 1 point:

- One point is earned for stating that MSC > MPC **or** that the MSC curve exceeds, is above, or is greater than the MPC curve.

(c) 1 point:

- One point is earned for correctly identifying the socially optimal quantity, Q_3.

(d) 2 points:

- One point is earned for correctly identifying the dollar value of the tax, P_4–P_1.
- One point is earned for correctly identifying the profit-maximizing quantity associated with the tax, Q_2.

(e) 1 point:

- One point is earned for correctly stating that the deadweight loss increases because the monopolist's profit-maximizing quantity is equal to the socially optimal quantity before the tax and is less than the socially optimal quantity after the tax.