

Answer on Question #44490 – Economics – Microeconomics

Task

A Monopolist faces a market demand curve of $P=100-2Q$, and has a total cost function of $C=130+10Q+0.5Q^2$.

Calculate the amount of monopoly deadweight loss.

Solution

$$P=100-2Q, C=130+10Q+0.5Q^2.$$

To calculate monopoly deadweight loss, we should find monopoly maximizing quantity ($MR = MC$) and price (from the demand curve) and competitive maximizing quantity ($MC = D$) and price ($MC = D$).

$$\text{For monopoly: } MC = C' = 10 + Q$$

$$MR = TR' = (P \cdot Q)' = 100 - 4Q$$

$$10 + Q = 100 - 4Q$$

$$5Q = 90$$

$$Q_m = 18 \text{ units. } P_m = 100 - 2 \cdot 18 = \$64, P_{mc} = 10 + 18 = \$28 \text{ (price for } MR = MC).$$

For competitive market:

$$10 + Q = 100 - 2Q$$

$$3Q = 90$$

$$Q_c = 30 \text{ units. } P_c = 100 - 2 \cdot 30 = \$40$$

$$\text{Deadweight loss} = 0.5 \cdot (64 - 40) \cdot (30 - 18) + 0.5 \cdot (40 - 28) \cdot (30 - 18) = 6 \cdot 36 = \$216.$$