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ECON2316

Lecture 19: Price Discrimination + Tariffs

Warmup

Note: $\pi = TR - TC = TR - VC - FC$
 $= PS - FC$

Inverse Demand: $P = 150 - 10Q$

Marginal Cost: $MC = 5Q$

Total Cost: $TC = 50 + 2.5Q^2$

a) Uniform pricing monopolist

$$TR = PQ = (150 - 10Q)(Q) \\ = 150Q - 10Q^2$$

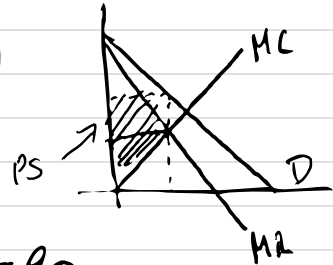
$$MR = 150 - 20Q$$

$$150 - 20Q = 5Q$$

$$25Q = 150 \Rightarrow Q = 6, P = 90$$

$$PS = P \times Q - VC = 90(6) - 2.5(6)^2 = 450$$

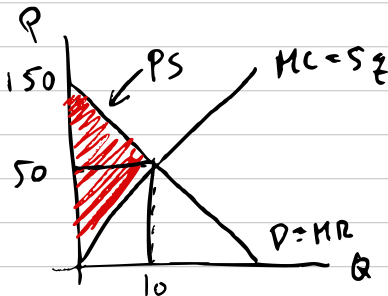
$$\pi = PS - FC = 450 - 50 = 400$$



b) 1st degree price discrimination

$$MR = 150 - 10Q$$

$$150 - 10Q = 5Q \Rightarrow Q = 10, P \text{ is variable, lowest price is } 50$$



$$PS = \frac{1}{2} (150)(10) \\ = 750$$

$$\pi = 750 - 50 = 700$$

Practice Question 2

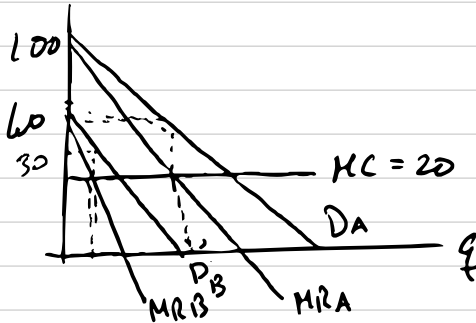
$$MC = 20$$

$$TC = 20q$$

P

2 Groups: $P = 100 - 2q_A$; $MR_A = 100 - 4q_A$

$P = 60 - 2q_B$; $MR_B = 60 - 4q_B$



for 3rd degree PD:

$$MR_A = MR_B = MC$$

$$q_A^* = 20, \quad q_B^* = 10$$

Recall: $TC = 20q$

$$TC = 20(q_A + q_B)$$

$$P_A = 60 \quad P_B = 40$$

$$\begin{aligned} \Pi &= TR - TC = (TR_A + TR_B) - (TC_A + TC_B) \\ &= (P_A q_A + P_B q_B) - (20q_A + 20q_B) \\ &= (60 \cdot 20 + 40 \cdot 10) - (20 \cdot 20 + 20 \cdot 10) \\ &= (1200 + 400) - (400 + 200) \\ &= 1000 \end{aligned}$$

Find market demand:

$$P = 100 - 2q_A, \quad P = 60 - 2q_B$$

$$P - 100 = -2q_A$$

$$\begin{aligned} q_A &= -0.5P + 50 \\ q_A &= 50 - 0.5P \end{aligned}$$

$$P - 60 = -2q_B$$

$$\begin{aligned} q_B &= -0.5P + 30 \\ q_B &= 30 - 0.5P \end{aligned}$$

$$q = 80 - P$$



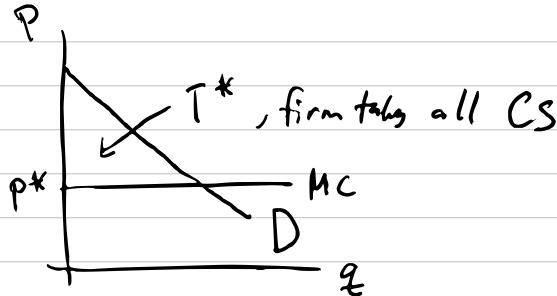
$$P = 80 - q$$

2nd Degree Price Discrimination

- Quantity or quality-based price discrimination
- Different prices for quantities (bulk discounts)
- or qualities (first class vs. coach)
- Self-selection - Consumers choose how much/what to buy
- May increase welfare compared to monopoly pricing

Two-Part Tariffs

- firm charges an entry fee, T
- usage fee, P , for each unit consumed
- Example - Costco membership + buying goods
- Optimal pricing strategy:
 - profit derived from entry fee
 - Usage fee equals w/ marginal cost of production
 - Low P , $P = MC$
 - Charge $T = \text{resulting CS}$



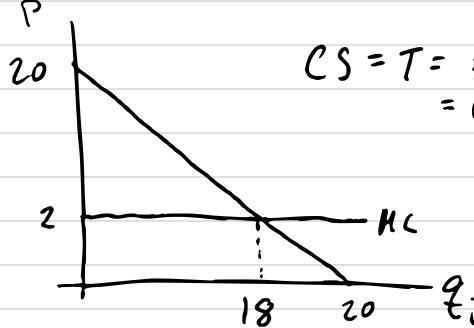
Example:

Each consumer has demand:

$$q_i = 20 - P$$
$$MC = 2$$

a) Find P and T in a 2-part tariff

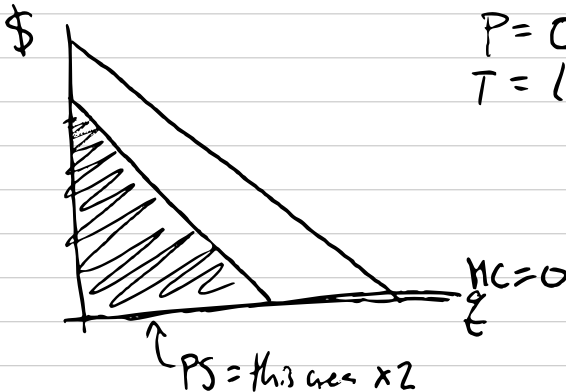
$$P = MC = 2$$



$$CS = T = \frac{1}{2} (18)(18)$$
$$= (9)(18) = 162$$

b) PS per consumer = 162

2 consumer types



$$P = 0$$
$$T = \text{low } CS$$

