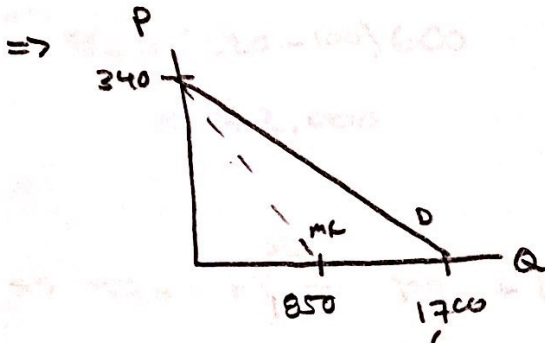


Segmenting (Third Degree Price Discrimination)

Let, Travelers have

$$Q_T = 1,700 - 5P_T$$

$$\Rightarrow P(Q_T) = 340 - \frac{1}{5} Q_T$$



$$\Rightarrow MR_T = 340 - (2) \frac{1}{5} Q_T$$

$$\Rightarrow MR_T = 340 - \frac{2}{5} Q_T$$

π condition
max

$$\Rightarrow MR_T = MC$$

$$\Rightarrow 340 - \frac{2}{5} Q_T = 100$$

$$\Rightarrow 240 = \frac{2}{5} Q_T$$

$$\Rightarrow 1,200/2 = Q_T$$

$$\Rightarrow Q_T^* = 600$$

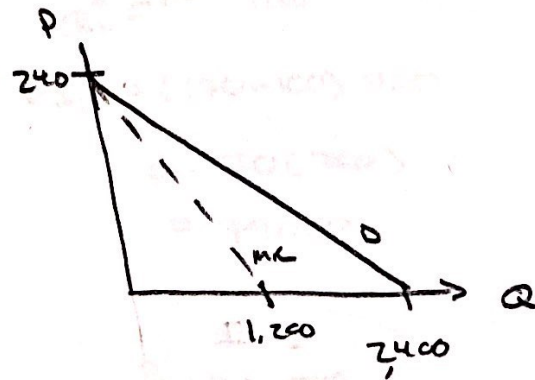
$$\Rightarrow P(Q_T^*) = 340 - \frac{1}{5} (600) = 220$$

\Rightarrow optimal bundle for each is

$$(P_T^*, Q_T^*) = (220, 600) \quad \& \quad (P_L^*, Q_L^*) = (170, 700)$$

$$Q_L = 2,400 - 10P_L$$

$$P_L = 240 - \frac{1}{10} Q_L$$



$$\Rightarrow MR_L = 240 - \frac{2}{10} Q_L$$

$$MR_L = MC$$

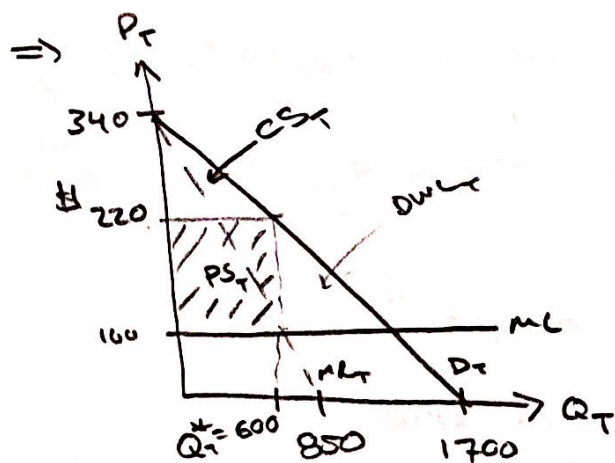
$$\Rightarrow 240 - \frac{2}{10} Q_L = 100$$

$$\Rightarrow 140 = \frac{2}{10} Q_L$$

$$\Rightarrow \frac{1400}{2} = Q_L$$

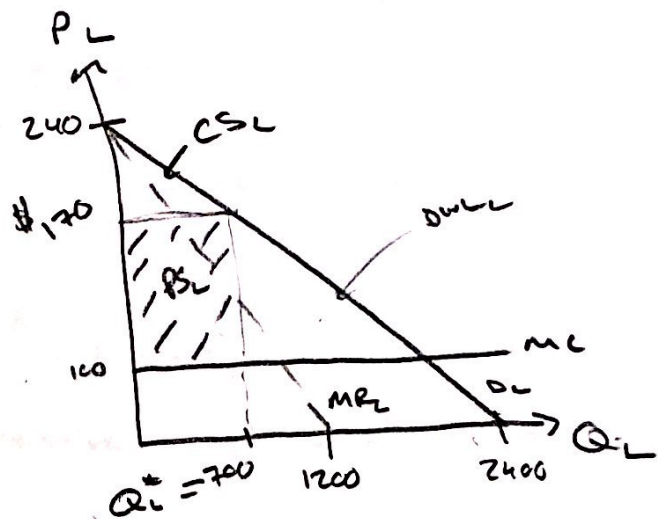
$$\Rightarrow Q_L^* = 700$$

$$\Rightarrow P(Q_L^*) = 240 - \frac{1}{10} (700) = 170$$



$$\Rightarrow PS_T = (220 - 100) 600$$

$$= 72,000$$



$$\Rightarrow PS_L = (170 - 100) 700$$

$$= 70(700)$$

$$= 49,000$$

>

$$\Rightarrow \text{Total } PS^{\text{PD}} = PS_T + PS_L$$

$$= 72,000 + 49,000 = \$121,000$$

How does this compare to the single price monopolist?

$$\Rightarrow Q_{\text{market}} = (1,700 - 5P) + (2,400 - 10P)$$

$$Q_{\text{market}} = 4100 - 15P$$

$$\Rightarrow 15P = 4100 - Q$$

$$\Rightarrow P(Q_{\text{market}}) = \frac{4100}{15} - \frac{1}{15}Q$$

$$\Rightarrow MR_{\text{market}} = \frac{4100}{15} - \frac{1}{15}(2)Q$$

$$= \frac{4100}{15} - \frac{2}{15}Q$$

$$\Rightarrow MR_{\text{market}} = MC$$

$$\Rightarrow \frac{4100}{15} - \frac{2}{15}Q = 100$$

$$\Rightarrow 2Q = 4100 - 1500$$

$$Q_{\text{market}}^* = \frac{2600}{2} = 1300$$

$$\Rightarrow (P^*, Q^*) = (186.67, 1300)$$

$$\Rightarrow P(Q_{\text{market}}^*) = \frac{4100 - 1300}{15}$$

$$\approx 186.67$$

$PS_{\text{market}} \Rightarrow$

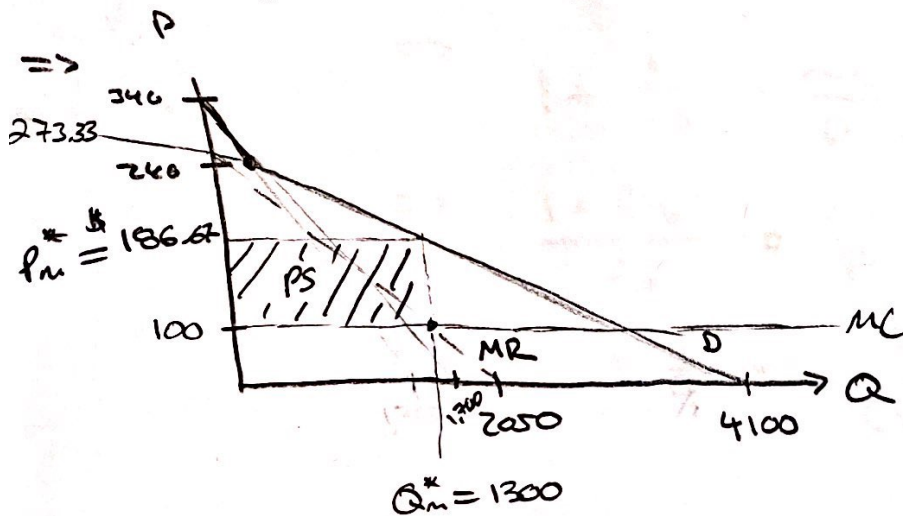
$$\Rightarrow PS = (186.67 - 100)1300 = 112,671$$

where, $PS^{\text{Price Discrimination}} > PS^{\text{market or monopolist}}$

$$\Rightarrow \$121,000 > \$112,671$$

\Rightarrow Monopolist has incentive to price discriminate.

Let's try to graph it



Lerner INDEX \rightarrow Inverse Elasticity Pricing Rule
(IEPR)

slide 10.3
(12/14)

$$\Rightarrow \text{Given, } \frac{(P - MC)}{P} = -\frac{1}{\epsilon_D}$$

$$\text{we } \epsilon_D = \frac{\Delta P}{\Delta Q} \frac{Q}{P}$$

$$\Rightarrow \frac{(\Delta P/P)}{(\Delta Q/Q)}$$

we solve for P

$$\Rightarrow 1 - \frac{MC}{P} = -\frac{1}{\epsilon_D}$$

$$\Rightarrow 1 + \frac{1}{\epsilon_D} = \frac{MC}{P}$$

$$\Rightarrow \frac{1 + \epsilon_D}{\epsilon_D} = \frac{MC}{P}$$

$$\Rightarrow P = MC \frac{\epsilon_D}{(1 + \epsilon_D)} \equiv \text{IEPR}$$

where, typically $\epsilon_D < 0$ due to law
of demand.