Example

$P_1 = 24 - Q_1$

$P_2 = 12 - 0.5Q_2$

$C = AC = MC = 6$

1) $P_1^*, P_2^*, Q_1^*, Q_2^*$

for 1

$TR = P_1 \times Q_1$

$TR = Q_1(24 - Q_1)$

$TR = 24Q_1 - Q_1^2$

$MR = 24 - 2Q_1$

$24 - 2Q_1 = 6$

$24 - 6 = 2Q_1$

$18 = 2Q_1$

$Q_1^* = 9$

$P_1^* = 15$

Profit $= TR_1 - TC$

$= (P_1^* - C) \times Q_1$

$= (15 - 6) \times 9$

$= 81$

for 2

$TR = P_2 Q_2$

$TR = (12 - 0.5Q_2) Q_2$

$TR = 12Q_2 - 0.5Q_2^2$

$MR = 12 - Q_2$

$12 - Q_2 = 6$

$Q_2^* = 6$

$P_2^* = 9$

Profit $= TR_2 - TC$

$= (P_2^* - C) \times Q_2$

$= (9 - 6) \times 6$

$= 18$

Profit $= \pi_1 + \pi_2$

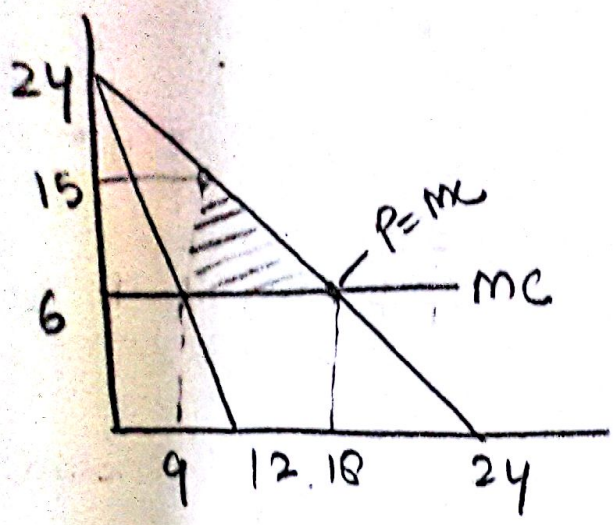
$= 81 + 18$

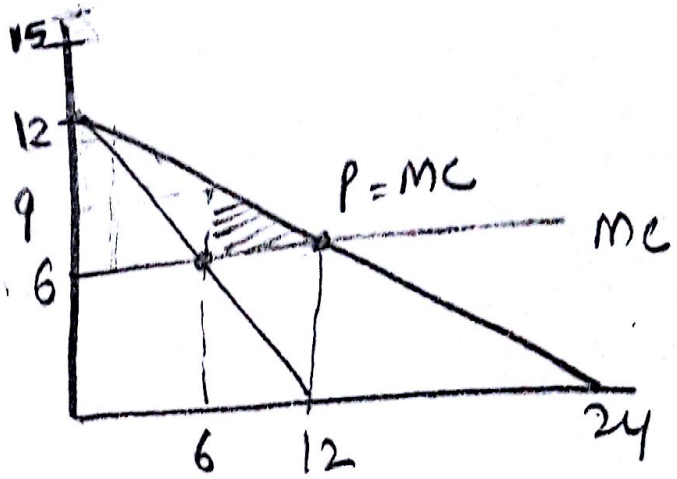
Profit $= 99$ — Total monopoly profit.

3) $DWL_1 = ?$ $DWL_2 = ?$

$0.5Q_2 = 12$

$Q_2 = 24$





$\frac{1}{2}(18-9)(15-6)$

$\frac{1}{2} \times 9 \times 9$

$= \frac{81}{2} = 40.5$

$6 = 12 - 0.5Q_2$

$6 = 0.5Q_2$

$Q_2 = 12$

DWL

$\frac{1}{2} \times (12-6)(9-6)$

$= \frac{1}{2} \times 6 \times 3$

$= 9$

$DWL = DWL_1 + DWL_2$

$= 40.5 + 9$

$\boxed{DWL = 49.5}$

Single price policy

if monopolist had to charge a uniform price then in this case he would stope serving market 2 and maximise Profits by charging

$P = 15$ (uniform price) [only in this example] not in genral.

find out DWL in Market 1 and Market 2

$DWL_1 = 40.5$

$DWL_2 = \frac{1}{2}(12-6)(12-0)$

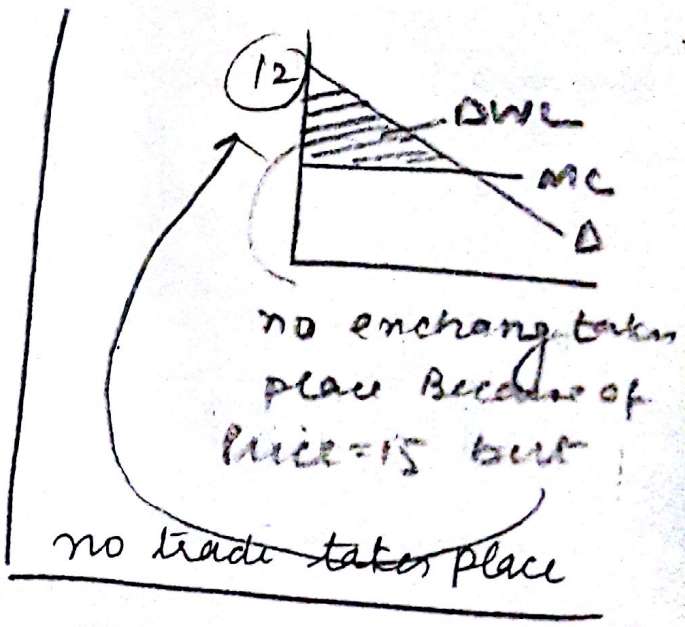
$= \frac{1}{2} \times 6 \times 12$

$\boxed{DWL_2 = 36}$

$DWL = DWL_1 + DWL_2$

$= 40.5 + 36$

$\boxed{DWL = 76.5}$



DWL under uniform price policy exceeds then two price policy (IIIrd Degree PD), hence we conclude that discrimination is some tyms welfare improving then single price policy.

IInd degree price discrimination

In linear two part tariff Consumers must pay a fixed fee for right to consume and (entry fee) uifome price for each unit consume (usage fee)

Example

amusment parks

Tariff is defined as

$$T(q) = \underbrace{a}_{\text{entry fee}} + \underbrace{pq}_{\text{usage fee}}$$

a = fixed fee / Entry fee

p_z marginal price

monopolist goal is to choose a and p so as to maximise profit.

Average price paid by consumer equal to

$$\bar{p} = \frac{T}{q}$$

$$\boxed{\bar{p} = \frac{a}{q} + p}$$

note)
Tariff is feasible only when those who pay low average price can not resell the good to those who must pay high average price

Case 1

Monopolist can set $P = MC$ and a = Consumer surplus of least eager buyer

Case 2

Monopolist can set $P > MC$. ~~and a~~ But here q decreases and some part of consumer surplus is converted into monopoly profit.

example a = CS for least eager buyer

monopolist face two demand curves

$$q_1 = 24 - P_1 \Rightarrow P_1 = 24 - q_1 \qquad MC = 6$$

$$q_2 = 24 - 2P_2 \Rightarrow P_2 = \frac{24}{2} - \frac{q_2}{2}$$

Qu:) P is set = MC $\qquad 0 = 12 - \frac{q_2}{2}$

find a=? and P=?

π = ?

find optimal part-tariff that maximise profit for monopoly such that $\pi = 2a + (P - MC)(q_1 + q_2)$