

Home work

Market demand : $P = 10 - Q$

MC up stream : $MC_{up} = 2$

$TR = (10 - Q)Q = 10Q - Q^2$

$MR = \frac{dTR}{dQ} = 10 - 2Q$

Demand upstream ; $P_{up} = 10 - 2Q$

$TR_{up} = (10 - 2Q)Q = 10Q - 2Q^2$

$MR = \frac{dTR_{up}}{dQ} = 10 - 4Q$

upstream Monopoly Max π

$MR_{up} = MC_{up}$

$10 - 4Q = 2$

$4Q = 8$

$Q = 2$

substitute $Q = 2$ in demand upstream ; $P_{up} = 10 - 2(2) = 6$

substitute $Q = 2$ in market demand ; $P = 10 - 2 = 8$

$CS = \frac{1}{2} \times 2 \times 2 = 2 \#$

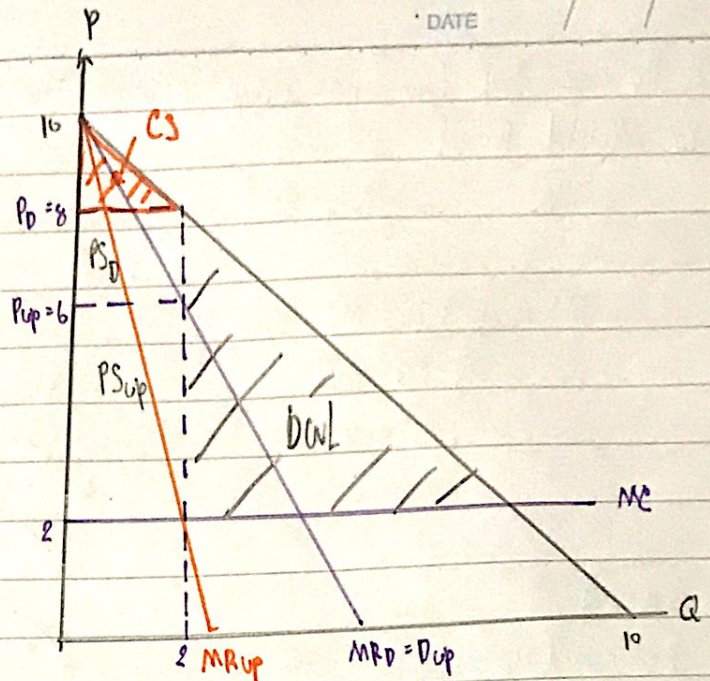
$$\left. \begin{array}{l} PS_D = 4 \\ PS_{up} = 8 \end{array} \right\} \text{Total } PS = 12 \#$$

$DWL = \frac{1}{2} \times 6 \times 6 = 18 \#$

$\pi_{up} = TR_{up} - TC_{up} = 6(2) - 2(2) = 8$

$\pi_D = TR_D - TC_D = 8(2) - 6(2) = 4$

$\text{Total } \pi = 8 + 4 = 12 \#$



In the case that two firms merge (monopoly case)

Ex. Market Demand : $P = 10 - Q$

MC : $MC_{up} = 2$

$$MR = 10 - 2Q = MC = 2$$

$$10 - 2Q = 2$$

$$2Q = 8$$

$$Q_m = 4$$

$$P_m = 10 - 4 = 6$$

$$\pi_m = 6(4) - 2(4) = 16 \text{ #}$$

$$CS = \frac{1}{2} \times 4 \times 4 = 8 \text{ #}$$

$$PS_m = 16 \text{ #}$$

$$DWL = \frac{1}{2} \times 4 \times 4 = 8 \text{ #}$$

$\therefore$ The profit of monopoly will be higher.

The welfare of consumers and producers in monopoly case will be higher.

