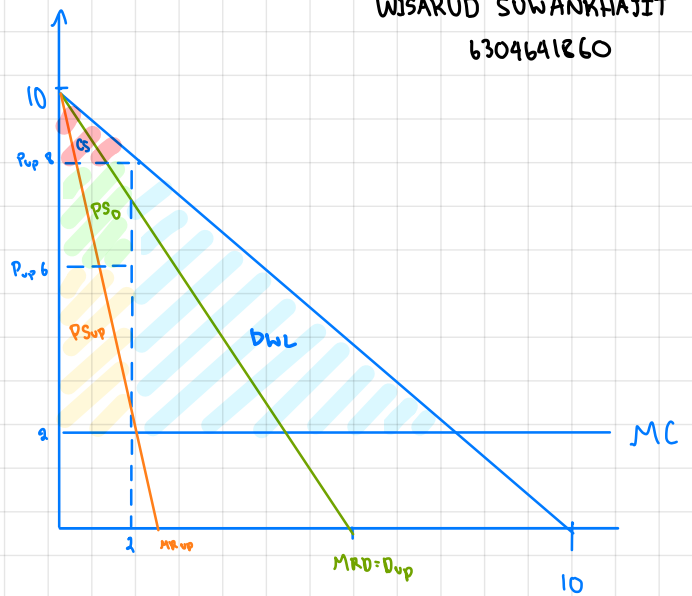


Market demand : $P = 10 - Q$
 $MC_{up} = 2$

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



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

$MR_{up} = MC_{up}$

$10 - 4Q = 2$

$Q = 2$

sub $Q = 2$; $P_{up} = 10 - 2(2) = 6$

sub $Q = 2$; $P = 8$

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

$PS_0 = 4$

$PS_{up} = 8$

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

Total $PS = 12$

$\Pi_{up} = TR_{up} - TC_{up} = 6 \cdot 2 - 2 \cdot 2 = 8$

Total $\Pi = 8 + 4 = 12$

$\Pi_D = TR_D - \Pi_D = 8 \cdot 2 - 6 \cdot 2 = 4$

In the case that two firm merge

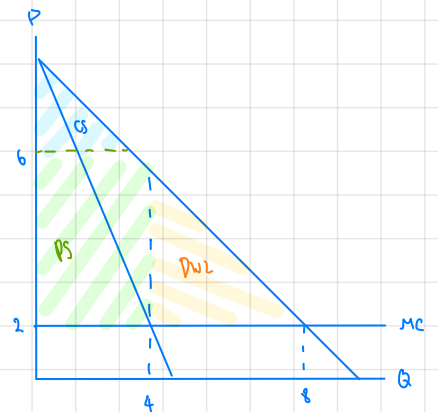
Market Demand : $P = 10 - Q$

MC : $MC_{up} = 2$

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

$10 - 2Q = 2$

$Q = 4$



$Q_m = 4$

$P_m = 10 - 4 = 6$

$\Pi_m = 6 \cdot 4 - 2 \cdot 4 = 16$

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

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

$PS_m = 16$

\therefore In this case the profit of monopoly will be higher.