

Ex₁: Market Demand : $D = 10 - a$
 MC upstream : $MC_u = 2$

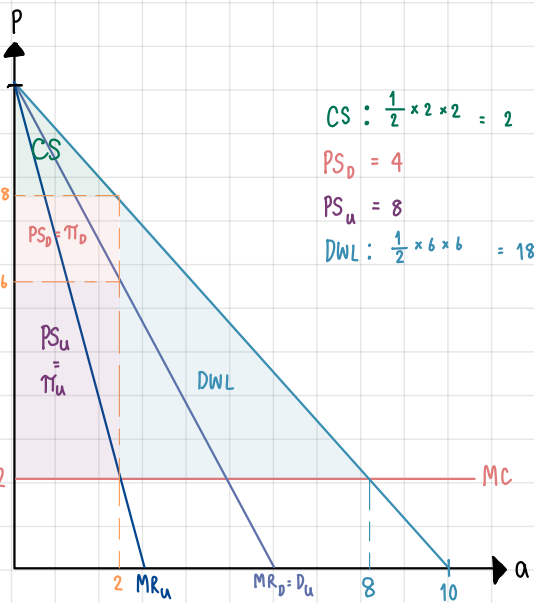
① $TR = (10-a)a = 10a - a^2$
 $MR = \frac{dTR}{da} = 10 - 2a$

∴ Demand upstream → $P_u = 10 - 2a$

② $TR_u = (10-2a)a = 10a - 2a^2$
 $MR = \frac{dTR_u}{da} = 10 - 4a$

③ Upstream Monopoly Max π

$MR_u = MC_u$
 $10 - 4a = 2$
 $4a = 8$
 $a_u = 2$
 $P_u = 10 - 2(2) = 10 - 4 = 6$
 $P_D = 10 - 2 = 8$

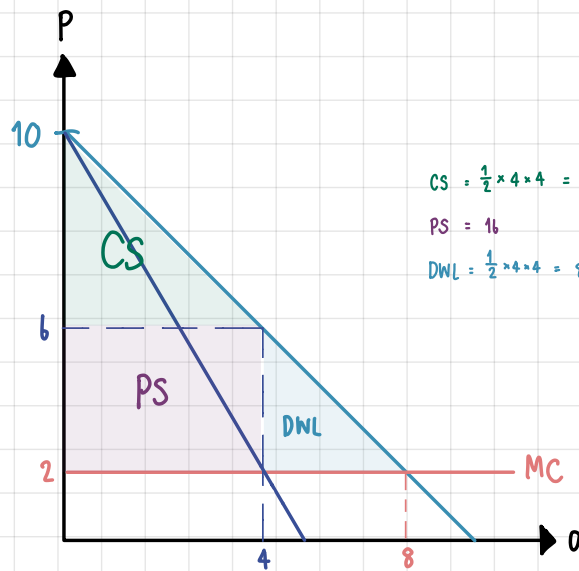


$CS = \frac{1}{2} \times 2 \times 2 = 2$
 $PS_D = 4$
 $PS_u = 8$
 $DWL = \frac{1}{2} \times 6 \times 6 = 18$

$\pi_u : TR_u - TC_u = 6(2) - 2(2) = 12 - 4 = 8$
 $\pi_D : TR_D - TC_D = 8(2) - 6(2) = 16 - 12 = 4$
 $\pi_{total} : \pi_u + \pi_D = 8 + 4 = 12$

Ex₂: Market Demand → $D = 10 - a$
 MC → $MC_u = 2$

$MR = MC$
 $MR = 10 - 2a = MC = 2$
 $= 10 - 2a = 2$
 $2a = 8$
 $a_u = 4$
 $P_u = 10 - 4 = 6$
 $\pi_u = 6(4) - 2(4) = 16$



$CS = \frac{1}{2} \times 4 \times 4 = 8$
 $PS = 16$
 $DWL = \frac{1}{2} \times 4 \times 4 = 8$