

Upstream

$$MC = 2$$

Find P^* , Q^*

$$MR = MC$$

$$P = 10 - 2(2)$$

$$10 - 4q = 2$$

$$= 6$$

$$q = 2$$

$$P = 10 - 2q$$

$$TR = (10 - 2q)q$$

$$= 10q - 2q^2$$

$$MR = 10 - 4q$$

Downstream

$$MR = 10 - 4q$$

$$MC = 6$$

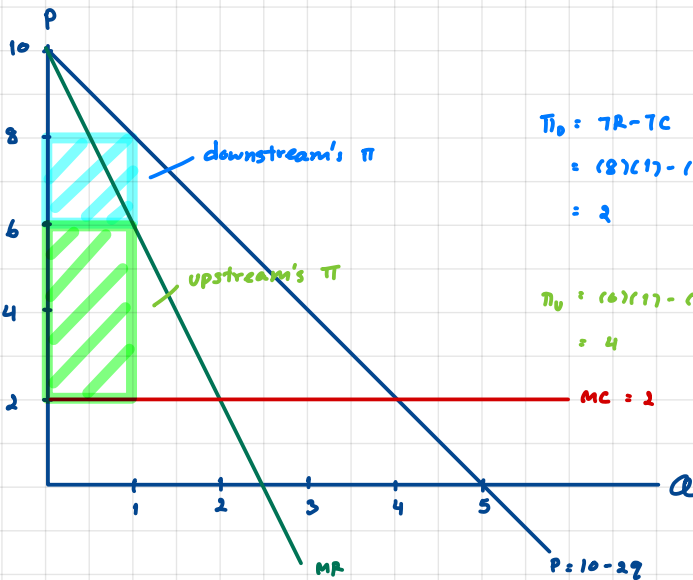
$$MR = MC$$

$$P = 10 - 2(1)$$

$$= 8$$

$$4 = 4q$$

$$q = 1$$



$$\begin{aligned} \pi_D &= TR - TC \\ &= (8)(1) - (6)(1) \\ &= 2 \end{aligned}$$

$$\begin{aligned} \pi_U &= (6)(1) - (2)(1) \\ &= 4 \end{aligned}$$

2 firms

$$P_D^* = 6, Q_D^* = 2, \pi_D^* = 2$$

$$Q_U^* = 1, \pi_U^* = 4, \pi_D^* = 2$$

Merge

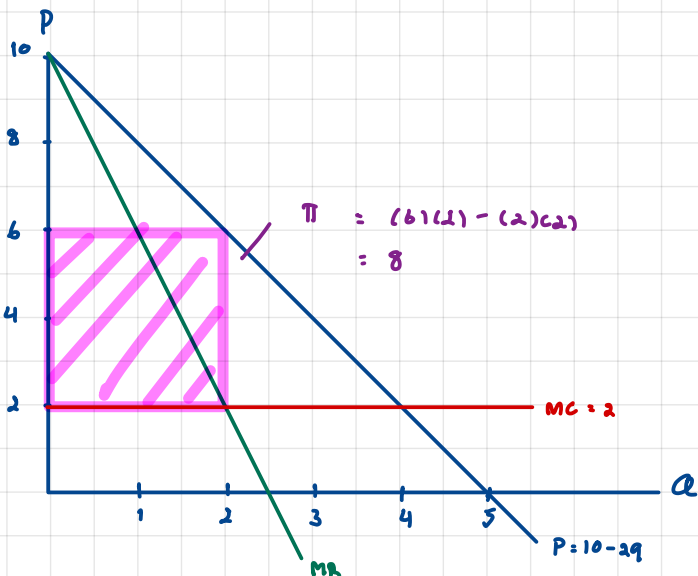
$$MR = MC$$

$$10 - 4q = 2$$

$$P = 10 - 2(2)$$

$$q = 2$$

$$= 6$$



$$\begin{aligned} \pi &= (6)(2) - (2)(2) \\ &= 8 \end{aligned}$$