

10.1 Nash Equilibrium - Cournot Duopoly

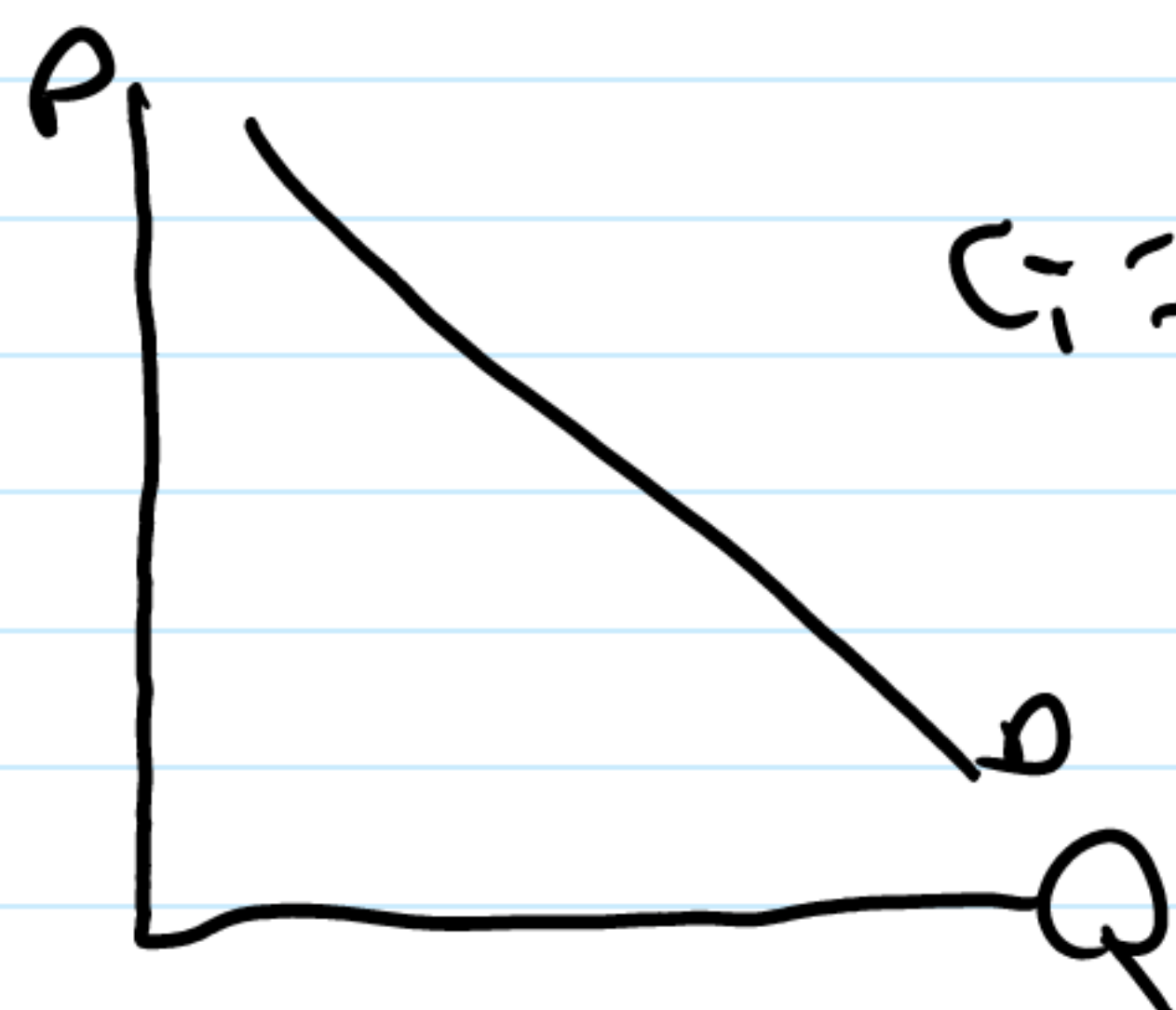
Wednesday, September 30, 2020 6:56 PM

$$P = 1 - Q$$

$$P = 1 - q_1 - q_2$$

$$Q = \sum_{i=1}^n q_i$$

$$Q_{-i} = Q - q_i$$



$$C_i = .2q_i$$

$$\pi_i = P \cdot q_i - \text{Cost} = (1 - q_1 - q_2)q_i - .2q_i$$

↓
revenue

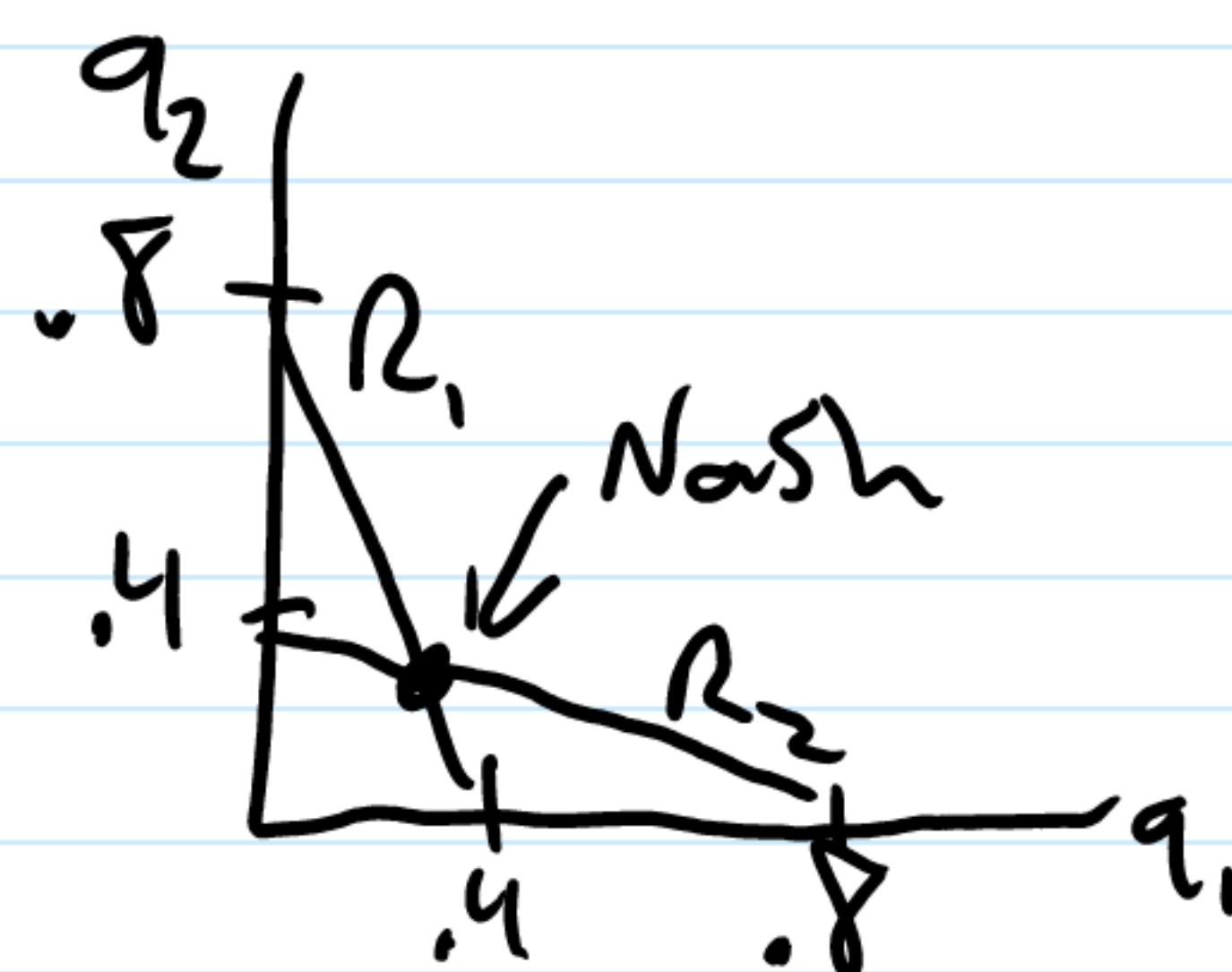
$$\frac{d\pi_1}{dq_1} = -q_1 + (1 - q_1 - q_2) - .2 = 0$$

$$2q_1 = 1 - q_2 - .2 \rightarrow q_1 = .4 - \frac{1}{2}q_2$$

$$BR_1(q_2) = .4 - \frac{1}{2}q_2 \rightarrow 0 = .4 - \frac{1}{2}q_2$$

$$\rightarrow q_2 = .8$$

$$\bar{q}_2 \uparrow \rightarrow \bar{q}_1 \downarrow$$



Different from Partnership

$$q_1 = .4 - \frac{1}{2}q_1 \rightarrow q_1 = 4/15$$