Q:- What is the follower's problem in a duopoly model and how does it differ from leader's problem? (15M)

(Ans) — Two types of leadership :-

1. Quantity leadership - Stackleberg Model
2. Price leadership - Bertrand Model

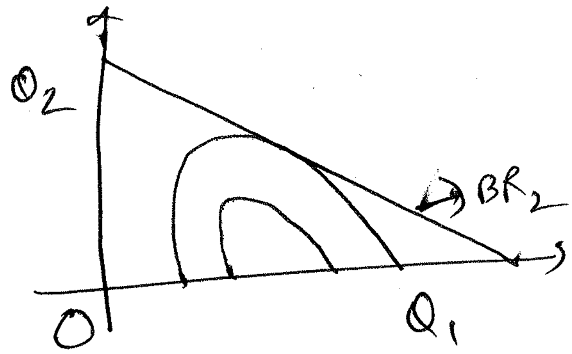
Problems in both the cases are same.

$\boxed{\text{Leader}}$ - Profit function - include follower's choice

$\boxed{\text{Follower}}$ → Best response function - after what leader has chosen.

Equilibrium takes place when Isoprofit curve of leader is tangent to Best Response functions of followers.

(Diagram)



Taking Quantity Leadership

$$P = a - bQ$$

$$Q = q_1 + q_2$$

$$\pi_1 = P \cdot q_1 = aq_1 - bq_1^2 - bq_1q_2 \quad (1)$$

$$\pi_2 = P \cdot q_2 = aq_2 - bq_2^2 - bq_1q_2$$

$$\frac{\partial \pi_2}{\partial q_2} = a - 2bq_2 - bq_1 = 0$$

$$\boxed{q_2 = \frac{a}{2b} - \frac{q_1}{2}}$$ → Best Response function

Leaders don't need response function, but followers needs response function.

Therefore in Stackleberg model, even though leaders produces monopoly output yet the price does not charge monopoly price and therefore there is no monopoly profit.