

ECN 453: Static Oligopoly Practice Problems

Question 1¹

Suppose that total demand is given by $P = 100 - Q$ where $Q = q_1 + q_2$ and there are two firms Firm 1 has a constant marginal cost equal to 20 and Firm 2 has a constant marginal cost equal to 10.

1. What is the Bertrand equilibrium?
2. What is the Cournot equilibrium?
3. What is the Stackelberg equilibrium if Firm 1 moves first and Firm 2 moves second?

Question 2²

In Tuftsville, everyone lives along Main Street, which is 10 miles long. There are 1000 people uniformly spread up and down Main Street, and every day they each buy a fruit smoothie from one of the two stores located at either end of Main Street.

Store 1 is located at the west end and Store 2 is located at the east end. Customers ride their scooters to and from the store using \$0.50 worth of gas per mile. Consumers buy smoothies from the store with the lowest price plus travel expenses.

1. What is the demand for smoothies for each store if Store 1 charges the price p_1 and Store 2 charges the price p_2 ?
2. Assume that marginal cost is constant and equal to \$1. Find the equilibrium prices.

Question 3

Suppose that consumers are distributed uniformly between 0 and 1. Firm 1 is located at 0 and Firm 2 is located at 0.75. Marginal costs are equal for both firms and equal to c . Constant transport costs equal to $0.5d$ where d is distance. Firms choose prices and compete under Hotelling competition.

1. Find the demand for each firm
2. Find the best responses
3. Find the Nash equilibrium prices

Question 4

Suppose that there are two firms that compete on quantities. Firm 1 is the incumbent and moves first and Firm 2 is a potential entrant and moves second (so this is a Stackelberg oligopoly). Market demand is given by $P = 40 - Q$. The marginal cost is $c = 10$.

1. What is the optimal price that Firm 1 should charge if it is a monopolist?

¹Question based on Pepall-Richards-Norman (2014)

²Question based on Pepall-Richards-Norman (2014)

2. What is Firm 1's profit if Firm 2 enters?
3. Suppose that Firm 2 must pay an entry cost of \$100 to enter. What value of q_1 deters Firm 2's entry?
4. Should the incumbent firm deter entry?