

## Exercise 7

### Oligopoly

1. A homogeneous products duopoly faces a market demand function given by  $P = 300 - 3Q$ , where  $Q = Q_1 + Q_2$ . Both firms have a constant marginal and average cost  $MC = AC = 100$ .
  - a. Derive the equation of each firm's best response function and then graph its curve.
  - b. Explain the economic intuition behind the shape of their best response functions.
  - c. What is the Cournot equilibrium quantity per firm and price in this market?
  - d. What would the equilibrium price and quantity in this market be if it were perfectly competitive?
  - e. What would the equilibrium price and quantity in this market be if the two firms colluded to set the monopoly price?
  - f. What is the Bertrand equilibrium price and quantity in this market?  
(Hint: This is the case of Bertrand Duopoly with a Homogeneous Product.)
  - g. Assuming that Firm 1 is the Stackelberg leader, find the Stackelberg equilibrium quantities for each firm and the market price.
  - h. Among i) Cournot equilibrium, ii) Competitive equilibrium, iii) Cartel equilibrium, iv) Bertrand equilibrium, and v) Stackelberg equilibrium, which one(s) is/are the most efficient for society? Which one(s) generate(s) the highest possible per-firm profit?
  - i. What are the Cournot equilibrium quantities and industry price when one firm has a marginal cost of 100 but the other firm has a marginal cost of 90?
  
2. RyanAir (denoted by subscript R) and EasyJet (denoted by subscript E) both fly between London and Paris. The demand curves for EasyJet and RyanAir are given, respectively, by  $Q_E = 500 - 2P_E + P_R$  and  $Q_R = 500 - 2P_R + P_E$ . Q and P stand for the number of passengers per day and the price, respectively. The marginal average cost of each carrier is £10 per passenger.
  - a. Derive the equation of each firm's best response function and then graph its curve.
  - b. Explain the economic intuition behind the shape of their best response functions.
  - c. What is the Bertrand equilibrium in this market?
  
3. Draw the diagram for the dominant firm model and explain the trade-off faced by the dominant firm.