

Discussion 12

Topics

- Monopoly
- Price Discrimination
- Cournot Duopoly

Problem 1

Verissoon is a monopoly in the provision of broadband plans in Madison. Verissoon's variable cost and marginal cost are given by $VC = 4q$ and $MC = 4$, respectively. Verissoon fixed cost is equal to \$1,500 (it requires a huge investment in infrastructure to be able to provide broadband plans). The demand for broadband plans in Madison is given by $Q = 84 - P$.

- Derive the TC for Verissoon. Does Verissoon's technology exhibit economies of scale?
- Derive the Marginal Revenue (MR) of Verissoon. Find the number of plans that Verissoon provides and the price at which they sell them. Is Verissoon making profits?
- Compute the CS and PS in the market. What is the DWL of this monopoly?

A rival firm Chartel, that has the same cost functions as Verissoon, is considering whether to enter the market or not. If Chartel enters the market, demand is equally split between both firms. Thus, the demand for broadband plans that Chartel would face in Madison is given by $Q = 42 - 0.5P$.

- Derive the MR for Chartel. Find the number of broadband plans that Chartel would offer and the price at which it would offer those plans if it decides to enter.
- Would Chartel enter the market of broadband plans in Madison?

Assume that Chartel doesn't enter the market, and that Verissoon finds a way to identify the willingness to pay for plans of every single person in Madison by spying on the internet usage of its customers. Suppose that Verissoon can charge different prices to different costumers.

- Find the number of plans that Verissoon would provide.
- Compute CS, PS, and DWL. Compare and explain your results with the numbers in c.

Suppose now that the local government only lets Verissoon to charge different prices to people under 35 years and people with 35 years or more in the following year. Fixed costs are now zero ($FC = 0$) but $MC = 4$ as before.

Verissoon estimates that the demand for broadband plans by age group is the following:

- D of people with less than 35 years: $Q = 64 - P$
 - D of people with 35 years or more: $Q = 44 - P$
- h) Find the price that Veriscon would charge to each of the different age groups if the firm can identify the age of the customers. How many plans would it sell to each group?
- e) Compute CS for each age group and Veriscon's profits. What is the DWL of the monopoly?

Problem 2

Consider the market for central processing units (CPUs), a key component in modern computers. This market consists of two firms: Intel and AMD. For simplicity, assume that both Intel and AMD have identical cost structures, where $MC = AC = 30$ (we would change this later) for each firm. On any given day, the market demand for CPUs is given by $P = 120 - Q$.

- (a) Suppose the market for CPUs was controlled by a monopoly with the same cost structure as Intel and AMD. How many CPUs would this monopoly produce (call this Q_M), and what price would it charge P_M ?
- (b) Suppose instead the market for CPUs was perfectly competitive, with every firm having the same cost structure as Intel and AMD. What would be the market equilibrium quantity Q_{PC} and price P_{PC} ?
- (c) Now return to reality, where Intel and AMD compete as Cournot duopolist. What is the reaction function of Intel? What is the reaction function of AMD?
- (d) Find the quantity produced by each firm in a Cournot equilibrium, q_{Intel}^* and q_{AMD}^* . Then find the market quantity Q_C and market price P_C under this Cournot duopoly.
- (e) Compare the three industrial structures: monopoly, Cournot duopoly, and perfect competition. Rank these in terms of firms profits and the welfare of consumers (Hint: there is no need to calculate anything here. Use your intuition to rank these by comparing prices and quantities only.)