HUL 211: Introduction to Economics
IIT Delhi
Practice Problems 3

January 28, 2025

1. (a) A firm has cost function

$$c(q) = \begin{cases} q^2 & q < 2 \\ q^2 + q - 2 & q \geq 2 \end{cases}$$

Derive the firm's supply curve, $q^*(p)$.

(b) A firm has cost function

$$c(q) = \begin{cases} q^2 & q < 2 \\ q^2 - q + 2 & q \geq 2 \end{cases}$$

Derive the firm's supply curve, $q^*(p)$.

Tâtonnement, is a process in which buyers and sellers 'quote' their demands and supplies at a given price to an auctioneer that increases the price if there is excess demand and decreases it if there is excess supply, with transactions only taking place when equilibrium is reached.

2. Consider an ascending auction environment for a unit good with n potential buyers.The price keeps on rising (ticking price) and the buyers respond if they wish to remain active and bid. A bid for any bidder is the highest bid at which he was active. The highest winner wins the object.

   (a) Suppose the auction ends at some finite time T. What is the excess demand/excess supply at any time $t < T$.

   (b) Suppose there are more than one but similar objects to be auctioned. Each bidder can buy at most one object. Assume that the number of objects are less than the number of agents, n. What is the excess demand/excess supply at any time $t < T$.

   (c) Suppose there are two different objects (discrete) to be auctioned. Now, each bidder bids for both goods simultaneously (a vector of prices). What is the excess demand/excess supply at any time $t < T$.

(d) Explain the tâtonnement process in all three environments and how would the market clear in equilibrium. What do you think would be the 'equilibrium' price?

(e) Suppose instead, we have descending auction, where the auction starts with some arbitrary but 'sufficiently high' price and falls by the ticking price amount and the process goes on until market clears. Repeat $(a), (b)$ *and* (c)

3. The demand for portable radios is given by: $Q = 5000 - 100p$. The local supply curve is given by $Q = 150p$.

   (a) Find the market equilibrium.

   (b) Suppose that radios can be imported at a price of 10 per unit. Find the market equilibrium and the amount of radios imported.

   (c) Suppose that the local producers convince the government to impose a tariff of 5 per radio. Find the market equilibrium, the total revenue of the tariff.

4. For each of the events described below, draw a supply and demand diagram that illustrates the event. Be sure to properly label all axes, curves and relevant points in your diagram. In the area to the left of your diagram, explain why you think your graph is correct. In that area, also answer the questions asked.

   (a) Gasoline: Strong growth in India, China, and the Middle East has increased worldwide demand for gas. What is the effect on the price of gasoline and on the quantity of gasoline sold?

   (b) Fresh fruit: Walmart, the nation's largest grocery retailer by far, vows to reduce the costs of growing, picking and transporting fresh fruit. Because it's now cheaper, families add more fresh fruit to their daily diets. What is the effect on the retail price of fresh fruit and on the quantity of fresh fruit sold?

   (c) Houses in Sacramento: Tighter lending standards make it more difficult for many families to borrow money to buy a house. At the same time, thousands of houses taken by banks through foreclosure are offered for sale. What happens to the price of houses and to the quantity of houses sold in Sacramento?