

Problem Set 1

N.B.: To be handed in on March 18th at the beginning of the course (in class or by e-mail)

Exercise 1 – Supply and demand

On the petrol market, the demand and supply functions are given by:

Demand: $Q^D = -P + 15$ (P : price of petrol)

Supply: $Q^S = P - 5$

- (i) Construct the two curves of demand and supply on the same graph. Show graphically and algebraically the price and the quantity exchanged at the equilibrium. Show graphically the total revenue of the producers as well as the total expenditures of the consumers on this market.
- (ii) What is the quantity exchanged on this market if the price is artificially set at 6 francs per unit? What is expected regarding the evolution of the price? What market price insures the largest quantity exchanged?
- (iii) Assume there is a decline in the price of engines that use petrol. The demand curve is now given by: $Q^D = -P + 16$
Calculate the new price and the new quantity exchanged at the equilibrium on this market. Give two other examples of events that can create such a shift.
- (iv) From the situation of point (i). Assume there is a decline in the price of oil (component needed to produce petrol) that modifies the supply function which is now given by: $Q^S = P - 3$
Identify and evaluate the imbalance on the petrol market at the initial price. Calculate the new price and the new quantity exchanged at the equilibrium on this market.

Exercise 2 – Producer's optimum

Would it be a good idea to increase the production of the medicine? Actually, a box of the medicine is sold for 4 CHF, and the factory could produce up to 900 boxes per week. The production costs for different production levels are described in Table 1.

Table 1

Quantity	0	100	200	300	400	500	600	700	750	800	900
Total cost	400	1000	1300	1500	1600	1700	1850	2200	2400	2650	3600

- (i) Find the quantity where the factory:
 - 1) Maximizes its profit.
 - 2) Does not do any benefits or losses.
- (ii) Draw on a graph the TC (total cost) and TR (total revenue) curves, and identify the production levels described in (i).
- (iii) What is the equilibrium for this factory, i.e. the optimal quantity produced?
- (iv) What would be the effect on the equilibrium and on the total profit if the price of the medicine boxes increased? Show this on a graph.
- (v) What would be the effect on the equilibrium and on the total profit of a decrease of the fixed costs?