

Microeconomics II

Name:

1. (10) Show that in a pure exchange economy where individuals' rational preferences satisfy local non-satiation every competitive equilibrium allocation is Pareto optimal.
2. (10) Consider a 2-good, 2-consumer exchange economy in which one consumer has lexicographic preferences. In this economy, a competitive equilibrium will not exist. True or false? (Prove or provide a counterexample.)
3. (10) Consider an economy where there are two goods, x and y , and two periods, today and tomorrow. There is uncertainty about the state of nature tomorrow, which can be either sunny (S) or cloudy (C). There are not markets for contingent trade, but there are spot markets at each date, and two securities, a and b . Security a pays 2 units of x if the state is S , and it pays nothing in C . Security b pays one unit of x in each state. Show that a Radner equilibrium is Pareto optimal by showing that the equilibrium allocation of x and y are the same that the one in the Arrow-Debreu economy with contingent markets for all prices (and no securities). (Hint: work out the budget constraints of the two problems to show that they give the same solution.)
4. (20) There are four persons, two goods (x and y), and no production is possible. Each person has the same preferences, described by the utility function $u(x, y) = xy$. The initial endowments are $\varpi_1 = \varpi_2 = (2, 0)$, and $\varpi_3 = \varpi_4 = (0, 2)$. Determine the core.
5. (20) Country C has two coasts (A and B) in which fish can be obtained. Total captures (in tons) in each zone are given by the functions $F_A = 200x_A - 2(x_A)^2$, and $F_B = 100x_B - 2(x_B)^2$, respectively, where x_A and x_B represent the number of ships fishing in each coast. The government has decided to give a license to fish to 100 ships. The fish is sold at $p = \text{€}100$ per ton and the cost of operating a ship is $\text{€}1000$.
 - (a) If each ship can fish in any of the two coasts, how many ships will operate in each coast?
 - (b) If the government decides that each license is valid only in one coast, what is the optimal way to distribute the 100 licenses?
 - (c) In the situation in (b), fishermen lobby for more licenses. Should the government increase the number?
6. (30) Consider an economy with two types of individuals and two commodities: a consumption good and labor. Individuals of type 1 can produce in their homes q units of the good using labor l , with the following technology: $f_1(l) = 2l^{\frac{1}{2}}$. Their utility is $u_1 = q_1$, where q_1 denotes the amount of the good they consume. Type 1 individuals do not have labor to use in producing output. Type 2 individuals have an unlimited amount of labor that they can supply. Their utility function is: $u_2 = q_2 - \frac{1}{2}(l_2)^2$, where q_2 denotes the amount of the good they consume and l_2 denotes the amount of labor they supply. Find the WE price and allocation if there are n_1 individuals of type 1 and n_2 individuals of type 2.