1. In a private ownership economy with H agents, L goods, and J technologies, assume that utility functions are continuous, strongly monotonic and strictly concave, and assume that production sets are non-empty, closed and bounded above. Let Y denote the aggregate production set and assume that there exists $\bar{x} \gg 0$ such that $\bar{x} \in \{\sum_{h} \omega^{h}\} + Y$.

Let z(p) denote the production-inclusive aggregate excess demand. Show that if sequence $\{p^n\}_{n=0}^{\infty}$ in \mathbb{R}_{++}^L converges to $p \in \mathbb{R}_{+}^L \setminus \{0\}$ with $p_l = 0$ for some l, then $Max\{z_1(p^n), z_2(p^n), _, z_L(p^n)\} \to \infty$

- 2. MWG 17.C.6 (whenever possible, trying to establish the connection with the underlying assumptions on preferences or the economic model)
- 3. Consider a pure exchange economy with two goods, x and y, and two consumers, 1 and 2. The respective endowments are: $\omega_1 = (4,0) \omega_2 = (0,4)$. The preferences of consumer 1 are lexicographic, with priority for y over x. The preferences of consumer 2 are represented by the utility function $U(x, y) = x + \sqrt{y}$.

Answer the following questions in a clearly drawn Edgeworth box:

(a) If this economy has Pareto optimal allocations, show them clearly on the diagram. If there are none, state that.

(b) If this economy has competitive allocations, show them clearly on the diagram. If there are none, state that.

(c) If this economy has core allocations, show them clearly on the diagram. If there are none, state that.

- 4. Consider a pure exchange economy where agent 1 is an altruist i.e. her utility function depends positively on the consumption by all other agents. Keep the standard assumptions for the remaining agents. State whether the walrasian equilibrium will be efficient for such an economy and prove that statement.
- 5. Find the Walrasian equilibrium for the following economy with production: X = min{2Kx,Lx}, Y = min{2Ky,Ly}, the total endowment of both capital and labor 200, and consumers are identical and have preferences that can be represented by U(x,y) = xy.
- 6. For the example seen in class, show that we can also achieve the Arrow-Debreu equilibrium starting from an Arrow rational expectations equilibrium.