Suggested Supervisions for Part I Paper 1 General Equilibrium, Externalities and Welfare.

Supervision 1 (end of week 2 or later)

Exchange, Competitive Equilibrium

1. "In a Pareto-efficient allocation, a given agent's utility must be higher than in a Pareto-inefficient allocation". Comment.

2. Two consumers, Alan and Betty, have the same utility functions, $u(x, y) = x^{\frac{1}{4}} y^{\frac{1}{4}}$. Alan has an endowment of $(1, 15)$ (i.e. 1 unit of x and 15 of y) and Betty has an endowment of $(15, 1)$.

(a) Draw the Edgeworth Box and sketch the set of Pareto-improving trades available to them. Show that if they agree to trade 7 units of x for 7 units of y they will reach an efficient outcome.

(b) Derive the equation of the Contract Curve.

(c) Now suppose that there is a competitive market for each good. Find the net demand functions (i.e. as functions of the two prices) of the two agents. Find the competitive equilibrium prices and quantities. Sketch the equilibrium price line. Show that the equilibrium is efficient.

(d) Verify that Walras' Law holds.

(e) If instead Alan's utility function were $u(x, y) = x^{\frac{3}{4}} y^{\frac{1}{4}}$, everything else being the same, what would the competitive equilibrium prices and quantities be? Comment on the resulting change in the distribution of wealth. Derive the equation of the Contract Curve and sketch it.

3. "Walras' Law says that total demands must equal total supplies, added up over all goods. This follows from the definition of competitive equilibrium." Comment.

4. "A competitive equilibrium allocation must be Pareto-efficient because, if it were not, two agents would negotiate a mutually beneficial trade". Comment.

Reading

Varian, Chap. 28.