Homework 2

due: Thursday, September 25, in class

Problem 1: Consider a family of farmers. Grandma owns the equipment to cultivate corn, grandpa the machinery for soybeans. Their offspring do all the work, growing either corn or soybeans. Furthermore, let us assume that the production functions for corn and soybeans are strictly concave with regards to their labor.

a) Starting from the condition of profit maximization, namely $pMP_L = w$ (pls derive this), construct the "Neary bucket". In your diagram, clearly denote the areas that represent the wage payments, as well as the rents going to grandma and grandpa respectively.

b) Now consider a relative price change, say corn becomes relatively cheaper and soybeans go up. How will this affect the real income of the three types of family members? Pls explain explicitly how the working members of the family are affected.

c) Discuss briefly how this view of the distributional effects of trade differs from the Stolper-Samuelson result. Which of the two views is more appropriate in a short-run as opposed to a long-run context — pls explain.

Problem 2: Let us take a closer look at the farm equipment industry and suppose it is characterized by monopolistic competition. Each producer has fixed costs of 10 million and marginal costs of 1,000 per piece. Each faces demand of the form $Q = S(1/n - (P - \bar{P})/500)$ where S, the total number of equipment sold in a given country, equals 500,000.

a) Derive the marginal revenue of each producer (assuming that they are too small to affect the average price $\bar{P}$). Set $MR = MC$ as a profit maximizing monopolist does and use the symmetry assumption to derive the price P as a function of the number of firms n.

b) In a diagram with P and average cost AC on the vertical axis and the number of firms on the horizontal axis, graph the relationship derived in a) as well as the average cost. What is the equilibrium number of firms and the equilibrium price?

c) Now, let there be four such countries, each with a domestic market of 500,000 pieces of equipment. What will be the equilibrium total number of companies under free trade and how high will be the price? Are there gains from trade?