Microeconomics
Fall 2011

Class #4: Perfect Competition. Monopsony.

David Henriques
Classes: 40, 41

Question 1
The calculator industry is perfectly competitive and the cost function of each plant is given by $TC(q) = 200 + 2q^2$. Total demand is given by $Q = 900 - 10P$.
a) Characterize the perfectly competitive equilibrium, with free entry (price, number of firms, individual production and size of the market).
b) A state laboratory discovered a new production technology and made it public. Now the cost function of each plant is characterized by $TC(q) = 225 + q^2$. Determine the new competitive equilibrium.
c) What is the social value of this discovery?
   Suppose now that the discovery was made by a private laboratory, which patented the discovery. Due to current regulations, each firm can have only one plant, so only one plant with this new technology will be operating. For the old technology there is free entry.
d) What is the new equilibrium? Find the equilibrium price, number of firms, the individual production of each and the total production.
e) For the private laboratory, how much is the value of this discovery? In this case what is the welfare impact of the new technology?

Question 2
Consider a firm with production function given by $y = \frac{9}{2}L - \frac{1}{2}L^2$ (where L represents the quantity of workers), that sells its output, y, in a perfectly competitive market at a price $p = 2$. Suppose this is the only firm that buys a certain type of workers, L_N, whose Labour Supply is given by $L_N = w_N - 1$.
a) Obtain the quantity of workers, L_N, and the value of the wage, w_N, that maximize the profits of this firm. Illustrate graphically.
b) Suppose now that the firm can recruit in the national market and in the international market. To hire international workers, L_I, the firm needs to pay a wage of $w_I = 3$. Compute the number of national and international workers, $(L_N$ and $L_I)$ hired by this firm and the new equilibrium wage in the national market, w_N.
c) Continue to assume the same conditions from the previous question. Suppose that the Government sets a minimum wage $\underline{w}_N$ in the national market. How will the quantities L_N and L_I change if the minimum wage is set as: (i) $\underline{w}_N = 4$, (ii) $\underline{w}_N = 1.5$. Motivate your answer. Sugestion: use graphical analysis.