PLCY 289 Problem Set 4

Questions 2 and 3 are due in class on Thursday March 2 2006. You may work together but should not copy answers verbatim and must hand-in individual assignments. Assignments will not be returned so make a copy of what you turn in.

1. A consumer in a particular economy has a utility function \( U(a, b) = \ln(a) + \ln(b) \). At a certain Pareto efficient allocation in this economy \( x^* \), this consumer holds \((10, 5)\). What are the competitive prices that support \( x^* \)?

2. In a two-good two consumer economy each person has the preference function \( U_i(a, b) = \ln(a_i) + \ln(b_i) \) \((i=1,2)\). There is one unit of each good available. Calculate the set of pareto efficient allocations and illustrate it in an Edgeworth box.

3. Professors Blue Devil and Tar Heel produce POMP (P) according to the production function \( P = 6H + 12 \) where H is total (daily) hours worked \((H=H_{TH} + H_{BD})\). Both individuals have preferences over POMP and leisure \((L)\) of the form \( U(P,L)= 6(L)^{1/2} + 2(P)^{1/2} \)
   a. If Prof. Tar Heel offers Prof. Blue Devil 3 units of POMP for every hour worked, how many hours will Prof. Blue Devil work and what will his level of utility be? (Thus, if BD works z hours he gets 3*(z*H) worth of P.)
   b. Given that Blue Devil is working according to (a), how much will Professor Tar Heel work? How many units of POMP would they produce?
   c. Show that this solution is not Pareto efficient (HINT: Compare MRS for each person). Would BD work another hour if TH offered him 4P to do so? Would TH be better off?

4. Consider a two consumer (Jawad and Sean) two good (food and clothing) economy where Jawad considers the two goods as perfect (1 for 1) substitutes while Sean considers them as perfect (1 for 1) complements. Write down an arbitrary set of initial endowments where both have positive amounts of each good and describe the set of allocations that is Pareto preferred to the initial allocation.

5. Problem 1-4 in BH page 389 (section 14.9) are also good practice.