Intermediate Microeconomics - Spring 2016

Mark Dean

Midterm

Wednesday 9th March

PLEASE ANSWER QUESTION 1 IN ONE BOOK, AND QUESTIONS 2 AND 3 IN A DIFFERENT BOOK

PUT YOUR NAME AND UNI ON ALL EXAM BOOKS

STAY CALM!

Question 1 Paul's preferences over widgets and gremlins is given by $u^P(x_w^P, x_g^P) = x_w^P + x_g^P$. His initial endowment is 4 widgets and 3 gremlins. Terrance's preferences are given by $u^T(x_w^T, x_g^T) = x_w^T x_g^T$ and has initial endowment of 10 widgets and 6 gremlins

1. (10 points) Draw an edgeworth box for this economy. Sketch the indifference curves that go through the initial endowment point. Is this point pareto efficient? If not, give an example of a point that pareto dominates it.
2. (15 points) Setting $p_g = 1$ (as we always do in an exchange economy), what are Paul and Terrance's demand for widgets and gremlins as a function of the the price p_w?
3. (10 points) Sketch a graph of the total demand of widgets (i.e. the demand of Paul plus the demand of Terrance) as a function of the price p_w. Find the price at which the demand for widgets equals the supply (hint: can it be an equilibrium for p_w to be greater than 1? Can it be an equilibrium for p_w to be less than 1?)
4. (5 points) What is the equilibrium allocation?
5. (5 points) Draw this point (and the equilibrium price line) in the edgeworth box. Also sketch the indifference curves that go through this point.

6. (10 points) Show directly that the equilibrium is Pareto optimal. Hint - you can check by solving the social planner's problem of maximizing the utility of Terrance while keeping the uility of Paul fixed at the level he obtains in the equilibrium

Question 2 Maeve was working as a waitress in a cocktail bar. She earns a wage of w for each hour she works, and she spends her money on maths lessons, which cost \$1 per hour.[1]

1. (10 points) Write down Maeve's optimization problem (assume that the two commodities are leisure (the hours she doesn't work) and maths lessons, and she has a utility function over these two commodities). Hint: what is Maeve's constraint? How many hours are there in the day?
2. (5 points) Draw Maeve's budget set
3. (15 points) Imagine Maeve changes jobs to a superior establishment, and now earns wage $v > w$ per hour. Will Maeve necessarily work more at this new establishment? Draw a picture or use the Slutsky equation to answer the question. If you think that the answer is no, explain what has to be true about Maeve's preferences for her to work fewer hours at the new wage

Question 3 (15 points) Aisha's preferences over cars are described as follow: One car is preferred to another if its fuel efficiency is higher by at least 2 MPG. Otherwise Aisha is indifferent between the two. Are Aisha's preferences complete? Are they transitive? Can they be represented by a utility function?

[1] During the exam, I clarified that you could assume that maths lessons did not take any time to complete if you so wished. It was also perfectly fine if you assumed that maths lessons did take 1 hour each.