

# Intermediate Microeconomics

Mark Dean

## Sample Midterm Questions

### To be discussed in class 13th October

Note that this is intended to indicate the type of questions that you will get, not the number!

**Question 1** Keith's preferences over cars are described as follow: One car is preferred to another if its fuel efficiency is lower by 2 MPG. otherwise Keith is indifferent between the two. Are Keith's preferences complete? Are they transitive? Can they be represented by a utility function?

**Question 2** True or false: if a bundle  $(x_1, x_2)$  solves a consumer's optimisation problem with prices  $p_1$  and  $p_2$  then the marginal rate of substitution between good 1 and good 2 at  $(x_1, x_2)$  is equal to the ratio of the prices?

**Question 3** 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 5 widgets and 3 gremlins. Terrance's preferences are given by  $u^T(x_w^T, x_g^T) = 3x_w^T + 2x_g^T$  and has initial endowment of 7 widgets and 6 gremlins

1. Draw an edgeworth box for this economy. Draw 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. 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. Graph the total demand of widgets (i.e. the demand of Paul plus the demand of Terrance) as a function of the price  $p_w$ . (*Hint: the demand curve should have two jumps in it*). Find the price at which the demand for widgets equals the supply.

4. What is the excess demand for gremlins at this price?
5. What is the allocation (i.e. the amounts of widgets and gremlins consumed by Paul and Terrance) at these prices
6. Draw this point (and the equilibrium price line) in the edgeworth box
7. Draw the indifference curves that go through this point.
8. Is this point pareto optimal?

**Question 4** Think about an economy with two consumers with endowments  $(\omega_1^1, \omega_2^1)$  and  $(\omega_1^2, \omega_2^2)$ . Write down the budget line equations for each consumers. Add the spending of consumer 1 to the spending of consumer 2, and show that this has to be equal to the value of the endowment of consumer 1 plus the value of the endowment of consumer 2. If the excess demand for good 1 is zero, then what is the excess demand for good 2? Congratulations! You have just proved Walras Law!

**Question 5** Paul's twin Paula has a demand over widgets and gremlins given by  $u^P(x_w^P, x_g^P) = x_w^P x_g^P$ . Terrance's twin Tina has preferences given by  $u^T(x_w^T, x_g^T) = x_w^T x_g^T$ .

1. Solve Paula and Tina's demand as a function of the price  $p_1$  and their endowments  $w_w^P, w_g^P$  and  $w_w^T, w_g^T$ .
2. Solve for the equilibrium price  $p_1$  as a function of the endowments
3. Would any change in the endowments lead to a change in equilibrium price? If not, what sort of changes would keep the equilibrium price the same? What is special about these changes?