Microeconomic Analysis

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Homework 3

Due Wednesday 11th October

Question 1 Here are some things that we stated in class, but I would like you to provide more details of

1. Give an example of preferences that are monotonic but not strictly monotonic (of course you need to prove that your claim is true)
2. Give an example of preferences that are convex but not strictly so.
3. Give an example of preferences which are convex but not monotonic
4. Show that convex preferences can be represented by a utility function which is quasi concave
5. Complete the proof that the consumer's problem with continuous preferences has a solution (i.e. show that the conditions of Weierstrass theorem hold)
6. Show that If $\succeq$ is convex then $x(p,w)$ is a convex set. If $\succeq$ is strictly convex then $x(p,w)$ is a function

Question 2 An important class of preferences are Cobb Douglas Preferences. For two goods, these can be written using the utility function $u(x_1,x_2)=x_1^{\alpha}x_2^{\beta}$ for some $\alpha,\beta>0$

1. Show that these preferences can equivalently be represented by the utility function $u(x_1,x_2)=\alpha\ln x_1+\beta\ln x_2$ (hint, use a theorem from the utility lecture 3 notes)
2. Are these preferences (strictly) monotonic? (strictly) convex? Homothetic?
3. Solve for the Walrasian demand function for these preferences

4. Is it ever the case that the consumer will choose to consumer 0 of either good? If not, why not?
5. What fraction of income is spent on each good?
6. Repeat parts 2-4 for the quasi-linear preferences $u(x_1, x_2) = x_1^{\frac{1}{2}} + x_2$