UADPhilEcon
Advanced Microeconomics – Module 1
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Problem Set 2
Consumer Choice

1. For each one of the following cases, draw the consumption set:
a) L=1 and the good must be consumed in integer amounts.
b) L=2 and consumption of good 2 is impossible unless the individual consumes at least an amount $b \in R$ of good 1.
c) L=2, minimum total level of consumption is $b_1 \in R$ and maximum total level of consumption is $b_2 \in R$, $b_2 > b_1$.
d) L=3 and consumption of each good cannot surpass $b \in R$.
For which one(s) of the above cases is the consumption set convex?

2. Assume that the demand for each good within a bundle is a function of its own price only and of wealth (that is, $x_m = x_m(p_m, w)$ for every $m = 1, \ldots, L$). Also assume that demand functions are homogeneous of degree zero. Show that if some good is inferior, then it is also a Giffen good.

3. Give a diagrammatic example of demand in R_+^2 that is consistent with the weak axiom of revealed preference, but does not satisfy Walras' Law.

4. In an economy with two goods, suppose that in period 1 there is equal demand for both goods (i.e. $x_1(p_1, p_2, w) = x_2(p_1, p_2, w)$). Then, in period 2, the price of good 1 increases from p_1 to p_1', while the price of good 2 decreases from p_2 to p_2'.
a) If the Slutsky wealth compensation for this change in prices is zero, find the relation between Δp_1 and Δp_2. Then, show on a diagram the locations for demand of period 2 that do not violate the weak axiom of revealed preference.
b) Suppose that in period 3 there is no change in wealth, the price of good 1 increases further to p_1'', while the price of good 2 remains unchanged (and hence, equal to p_2'). Use the diagram you made for (a) to show that any demand in period 3 is consistent with the weak axiom of revealed preference.

5. Assume a consumer having positive wealth w in an economy with two goods only, priced $p_1 > 0$ and $p_2 > 0$.
a) Draw the budget set $B_{\boldsymbol{p},w}$ and choose a point for consumption $\boldsymbol{x}$ that satisfies Walras' Law and the requirements $x_1 > 0$ and $x_2 > 0$. What is the slope of the budget line?
b) Suppose that the prices change from $\boldsymbol{p}$ to $\boldsymbol{p}'$, $p_1' = p_1$, $p_2' > p_2$, and that the new budget line passes through $\boldsymbol{x}$. Draw $B_{\boldsymbol{p}',w}$ and the new budget set $B_{\boldsymbol{p}',w'}$ on the same figure you made for (a). What is the new level of wealth w'? Show Δw on your figure.
c) Indicate (on the figure you've drawn) all the points for consumption under prices $\boldsymbol{p}'$ and wealth w' that agree with the weak axiom of revealed preference (note that they don't necessarily have to satisfy Walras' Law).

6. Show that if demand satisfies Walras' law, $\boldsymbol{x}(\boldsymbol{p}', w') \neq \boldsymbol{x}(\boldsymbol{p}, w)$, and the condition $\boldsymbol{p} \cdot [\boldsymbol{x}(\boldsymbol{p}', w') - \boldsymbol{x}(\boldsymbol{p}, w)] > 0$ holds for any two price-wealth situations $(\boldsymbol{p}, w)$ and $(\boldsymbol{p}', w')$, then the weak axiom of revealed preference implies that $(\boldsymbol{p}' - \boldsymbol{p}) \cdot [\boldsymbol{x}(\boldsymbol{p}', w') - \boldsymbol{x}(\boldsymbol{p}, w)] < 0$, even for uncompensated price changes.

7. Mas-Colell, Whinston and Green: Exercises 2.D.1, 2.D.2, 2.E.2, 2.E.4, 2.E.5, 2.E.7, 2.F.2, 2.F.3, 2.F.6, 2.F.10, 2.F.11, 2.F.12, 2.F.14, 2.F.16, 2.F.17