

Homework 2

due: Wednesday, Feb 11, in class

Problem 1: Consider the following three utility functions: $U1(x, y) = ax+y$, $U2(x, y) = xy$, and $U3(x, y) = \ln x + \ln y$.

- Graph 3 indifference curves for each utility function.
- Provide an example where preferences can be represented by the first utility function.
- Calculate the MRS for each utility function.
- Comment on the similarity between the second and third utility function.

Problem 2: Suppose a country subsidizes private electricity consumption so that, instead of the regular price p_e per unit, households only have to pay $p_e - s$. However, the country regularly experiences black-outs (did anyone say California) and finally calls in a famous Austrian economist to fix the problem. His advise: spend the same amount per capita that is now needed for the subsidy on providing free electricity, and if consumers want to buy more charge them the regular price p_e . To solve this problem, let us assume that consumers receive income I and face a price p_o for a composite of other goods.

- Sketch the initial and the new budget constraint.
- Show that electricity consumption decreases under the new scheme.
- Who benefits from this new policy?

Problem 3: Your preferences for books and booze can be represented by the (so-called Cobb–Douglas) utility function $U(x, y) = x^\alpha y^{1-\alpha}$, your income is I , and you face prices p_x and p_y .

- Find your optimal demands for x and y as functions of p_x , p_y , and I .
- Calculate the expenditure shares $\frac{p_x x}{I}$ and $\frac{p_y y}{I}$ and provide an interpretation for the exponents α and $(1 - \alpha)$.
- Calculate the income elasticities of your demands. What would this imply for the alcohol consumption of a homeless have-not versus the thirst of Bill Gates.

Problem 4: Let preferences be represented by the “Leontief” utility function $U(x, y) = \min(2x, y)$.

- a) Graph a few indifference curves and provide an example that fits these preferences.
- b) Derive the demand functions, i.e. x and y as functions of p_x , p_y , and I . Tread carefully and don't be too eager to use calculus (you never thought I would say this, did you?).
- c) Calculate the cross-price elasticities and discuss their sign.