1 Homework

1.1 SOK-3008 Models for Market Analysis

Homework: *General Theoretical Restrictions*

The utility function is $U(\mathbf{q}) = q_1^2 q_2^2$. Cost or income function by its definition is $y = p_1 q_1 + p_2 q_2$

Questions:

1. Derive the Marshallian demand function for q_1 and q_2, respectively. Estimate the own-price, cross-price and income elasticities.
2. Show the elasticities derived in question 1 satisfy the general restrictions.
3. Derive the Hicksian demand function for q_1 and q_2, respectively. (can be done both by optimization (cost min), but also through the principles of duality using the results from exercise 1. You *should* do both and confirm they yield equal results.). Estimate the own-price, cross-price and income elasticities.
4. Show the elasticities derived in question 3 satisfy the general restrictions.
5. Discuss the economic differences between the Marshallian price elasticities in question 1 and 2 and the Hicksian price elasticities in question 3 and 4.

1.1.1 Hints for duality approach in exercise 3

First find the indirect utility function, $v(\mathbf{p}, y)$. Use the fact that $v(\mathbf{p}, e(\mathbf{p}, u)) = u$ to derive $e(\mathbf{p}, u)$. Apply Sheppard's lemma: $\frac{\partial e(\mathbf{p},u)}{\partial p_i} = h_1(\mathbf{p}, u)$, where h_i is the hicksian demand for the ith good.