

Problem Set 3

Key concepts:

- Substitute and complementary goods
 - Normal and inferior goods
 - Market demand
 - The concept of elasticity
 - Price elasticity of demand
 - Cross-price elasticity of demand
 - Income elasticity of demand
1. An article in *The New York Times* described a successful marketing campaign by the French champagne industry. The article noted that "Many executives felt giddy about the stratospheric champagne prices. But they also feared that such sharp price increases would cause demand to decline, which would then cause prices to plunge." What mistake are the executives making in their analysis of the situation?
 2. Imagine a world populated by only two consumers; let us call them Robinson Crusoe and Friday. We know that the two individual demand functions for coconuts are

$$P_{RC} = 50 - 2Q$$

and

$$P_F = 50 - Q.$$

The United Nations sent you to study that peculiar society.

- (a) You are parachuted into the island and your mission is to estimate the aggregate demand function.
- (b) What is the new aggregate demand after Friday decided to lose weight and his demand for coconuts dropped to

$$P_F = 20 - Q?$$

3. The function below describes the demand for theatre tickets:

$$Q_D = 100 - 2P$$

- (a) What is the price elasticity of demand when price falls from €40 to €35. Comment on your findings.
- (b) Compute the price elasticity of demand when price rises from €35 to €40. Explain the difference between the two calculations.
- (c) What is point elasticity of demand for the following prices; $p = €40$ and $p = €30$.
- (d) Sketch the demand function and show its elastic and inelastic segments.

4. Consider the following values of price elasticity of American private consumers of electricity and natural gas (data from 2006):

	Electricity	Gas
Long Run	-0.24	-0.12
Short Run	-0.32	-0.36

- (a) Interpret the values, classify the demand as elastic/inelastic. What is the reason for the difference between the short and the long run?
- (b) What sign of cross-price elasticity do you expect for these two goods?
5. The following table shows diverse elasticities for demand for water in Portugal.

	Elasticity
Price	-0.111
Income	0.091
Temperature	0.682

- (a) What can you say about the demand for water? Is it price-elastic? Is it a normal or luxury good?
- (b) According to what you learn in (a), what problems this may create during a drought?
6. How might these factors influence the price elasticity of demand:
- (a) the existence of substitutes;
- (b) the weight of the good in the consumer's budget;
- (c) the time perspective.
7. A typical coffee drinker benefited from a raise in her income from €1000 (time 1) to €1200 (time 2).
- (a) Find the income elasticity of demand assuming that the demanded quantity rose from 40 to 50 coffee cups per month.
- (b) What kind of good is it?
8. In the street market in Vienna you can find food sellers specialized in Kebab and those specialized in Chinese Spring Rolls. The consumers are used to pick-up food while shopping around in the market. Cross-price elasticity of demand for Kebab in relation to the price of Spring Rolls is 0.5.
- (a) Estimate the impact on the demand quantity of Spring Rolls when the price of Kebab rises by 4%;
- (b) What kind of goods are Kebab and Spring Rolls?

9. Consider a following individual demand function:

$$x_1(p_1, p_2, m) = \frac{p_2 \cdot m}{4p_1^2 + p_1 \cdot p_2}$$

- (a) Is the good 1 for the consumer a normal or inferior good?
- (b) Is the good 1 a Giffen good?
- (c) Is good 1 a substitute or a complement for good 2?

10. **(Somehow more difficult!)* Show that if a consumer spends her whole income on two goods and one of them is inferior than the other has to be a luxury good.