Problem Sets
(English Version)

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Michal Šoltés*

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This document is a part of materials used in the course of Theory of National Economy I & II (soon to be Econ 101 & Law and Econ) taught at the Faculty of Law, Charles University. The purpose of this document is to provide students with problem sets and provide a structure to TA sessions. The document is organized so that it follows the structure of the course, i.e. for every lecture there is a corresponding problem set.

Students are expected to:

- Read the corresponding material in the textbook before starting the problem set.
- Try to solve all of the problems, even though some of them may be complicated.
- Know and understand the solution to all of the problems **after** the TA session, not necessary before the TA session.
- Learn from their mistakes throughout the course and not during the final exams.

*Thanks go to Dr. Josef Montag.

1 Lecture 1

Reading

- Mankiw, Chapter 1 (Ten Principles of Economics)
- Mankiw, Chapter 2 – appendix (Graphing: A brief review)

Problems

Problem 1.1. During the first lecture, Dr. Montag said that TA sessions are complements to the lectures and not substitutes.

(a) What does this mean? Explain.

(b) How does this affect your decision to participate in lectures and TA sessions?

(c) Think of different examples of complements and substitutes in real life. When does it make sense to have one without the other?

Problem 1.2. Opportunity cost is a key concept for economists.

(a) Explain what it is.

(b) What are your opportunity costs of studying law?

(c) Suppose you can choose between going to the cinema and paying \$10 for a ticket or staying home and doing your problem set for the next TA session. What is the opportunity cost of doing your problem set, and what is the opportunity cost of going to the cinema?

(d) Assume the situation described in (c). How would the opportunity cost change if, instead of preparing for a *regular* TA session, you need to prepare for a midterm exam? Would that change your decision?

(e) Assume the situation described in (d). How is it possible that the same movie for the same price of \$10 is now more *costly*?

Problem 1.3. While market mechanisms are a powerful tool to organize economic activity, there are situations in which the market mechanisms fail, and then we talk about market failures. For the following examples of market failures, please explain: (i) what we call the particular market failure; (ii) why the market cannot solve the problem described; (iii) how the government can intervene.

(a) Tourists get drunk and disturb the peace, quiet, and comfort of the locals.

(b) A consumer buys a second-hand car with the odometer rolled back.

(c) (Almost) everyone uses Wikipedia, but only a tiny fraction of users pay for it.

Problem 1.4. Suppose you travel from Brno to Prague by car on the D1 highway, the distance is 180 km. Throughout the drive, you keep a constant speed of 120 km/h.

(a) How long does it take to get to Prague? What is the speed measured in km/min? How long does it take to drive 1 km?

(b) Draw a graph with time (measured in minutes) on the horizontal axis denoted as T, and the distance traveled (measured in km) on the vertical axis denoted as D. Make sure the graph is large. Next, draw a line that captures the relationship between these two variables (i.e., a line that shows the distance traveled as a function of time spent on the highway).

(c) Write down a linear function ($D = \alpha T$) of the relationship between the time and the distance traveled.[1] What is the interpretation of α? What in the graph corresponds to the α? What would happen with the graph if your speed was 150 km/h, instead of 120 km/h?

(d) Draw a new graph with the same axes and plot a function capturing the distance traveled for each minute you spent on the highway. That is, the line tells the distance traveled during the first minute, during the second minute, the third minute, and so on. What in the new

[1] Hint: Solve the equation and plug in a combination of specific time and distance.

graph corresponds to the α and to D, i.e., the distance traveled? What would happen with the graph if your speed was 150 km/h, instead of 120 km/h?