

Brush-up math course 2021-2022

References

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General references

The main goal of the course is to provide students with basic math tools which are essential to solve economics problems. The course focuses on practical implementation of math in economics and contains a reduced version of a theory. Since the course covers multiple fields of maths, I used several resources to construct it. The two main resources for the course are:

- **Essential Mathematics for Economic Analysis**

Knut Sydsæter, Peter Hammond, Arne Strøm, Andrés Carvajal

This is a basic book on which the course was built. It contains excellent examples and exercises to practice essential math tools.

- **Mathematics for Economists**

Carl P. Simon, Lawrence Blume

It is a more advanced book than the previous one and uses more mathematical language. However, it also provides interesting examples and explanations.

The additional resources:

- **Introduction to Mathematical Logic**

Elliott Mendelson

I used this book to prepare part of the course containing an introduction to logic.

- **Mathematical methods for economic theory**

Martin J. Osborne

Examples and exercises from this book were used to prepare the last part of the course - optimisation.

Introduction - basic math concepts

To prepare materials for this chapter I used the following resources:

- **Essential Mathematics for Economic Analysis:** chapters 1-5
- **Introduction to Mathematical Logic:** chapter 1

Linear algebra

This chapter is based on my own notes. I supplemented my own materials by **Essential Mathematics for Economic Analysis** chapter 15 and 16.

Calculus

The material of this chapter is based on the following resources:

- **Mathematics for Economists:** chapters 2-4
- **Essential Mathematics for Economic Analysis:** chapters 6-9, 11-12

Optimisation

The last chapter of the course is built using the following resources:

- **Mathematics for Economists:** chapters 18-19
- **Essential Mathematics for Economic Analysis:** chapters 13-14
- **Mathematical methods for economic theory:** chapter 4

Additional resources

The list of resource above does not exhaust all possible materials which you can find to improve your math skills. Please find below the list of additional resources which can be useful in the learning process:

- [Khan Academy](#) - a platform with free online courses for nearly every subject
- [Coursera](#) - a platform with online courses (some of them are free)
- [WolframAlpha](#) - a computational knowledge engine, which can be useful to find a solution to complicated integrals or derivatives
- [Desmos](#) - an online tool to plot functions

Final remarks

I would like to sincerely thank [Rubén Pérez-Sanz](#), who provided this course in the past and shared with me some of his materials.