

# Math Brush-up BGSE 2019-20

## EPP - Competition

### REFERENCES

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#### General references

This course was prepared in the summer of 2019. During this period several books and web pages were consulted, as a result there is no one book that mimics the whole course. Nonetheless these are the main references that I have followed to write the Lecture notes:

- **Essential Mathematics for Economic Analysis**, K.Sydsaeter and P.Hammond

This is the main reference for the basics, it is also an excellent guide for calculus and optimisation which you should go over in case of trouble.

- **Mathematics for Economists**, Carl P. Simon and Lawrence Blume

It is a more advance book than the previous one and with higher mathematical rigour. Essentially is what every undergraduate should be taught during the first two years in order to have a good grasp of economic concepts

- **Calculus with Analytic Geometry**, George F. Simmons

This book is the bible for an introduction to calculus and it is the kind of level that is taught at MIT. The price of a second-hand book ranks from 40\$ to 150\$ (The price reflects the value in terms of knowledge of the book)

Apart from these references there are some websites that have popped up in the last years:

- [Khan Academy](#) : Best option ever, it is always a good reference no matter if you have lack of knowledge of a whole subject or one concept.
- [CK-12](#) : More focused on teachers work, though it has great applets to built up on intuition.
- [eCalculus](#) : Excellent webpage for problems and standardised exams

## Basics

At the point of taking the course this topics should be taken for granted, i.e. you should already know them and with little review you should catch up. There are two main references for the basics of this course:

- **Essential Mathematics for Economic Analysis**
  1. Introductory Topics I: Algebra
  2. Introductory Topics II: Equations
  3. Introductory Topics III: Functions
  4. Functions of One Variable
  5. Matrix Algebra and Vector Analysis
  6. Determinants and Vector Matrices
- My notes that I did during the course 2016-2017 while I was doing the whole Khan Academy algebra course, they cover lightly most of the points of the basics.

## Calculus

This part was taken entirely from the George F. Simmons reference but the last part which was taken from the web page of Martin J. Osborne

# Optimisation

The whole optimisation course and exercises was taken from the web page of [Martin J. Osborne](#)