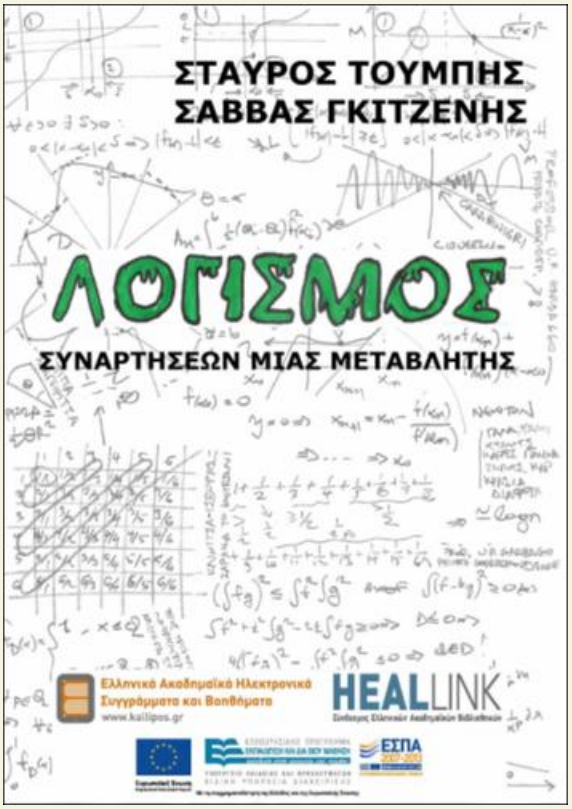

METADATA

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Abstract

The textbook is intended for use in teaching the basic theory of single-variable calculus. It is aimed at first-year students at Greek universities and takes into account the knowledge they have acquired in high school, particularly during their preparation for the Panhellenic Exams. It includes chapters on number theorems, limits, continuity, derivatives and their applications, the definition of integrals and their basic properties and applications (in volume and length calculations, etc.), differential equations, Taylor polynomials, sequences, series, and some elements of analytical geometry (vectors and conic sections). Although the textbook can clearly be used in Mathematics, Physics, and Polytechnic School departments, due to the wide range of material it covers, the book is ideal for teaching in departments that include a relatively small number of mathematics background courses and devote approximately one course to single-variable calculus and related topics.

There are dozens of such departments in Greece, e.g., university departments of computer science, biology, chemistry, economics, etc., as well as Technological Educational Institutions (TEIs). The main objectives of the book are: - For students to deepen their knowledge of the material they already know from high school, i.e., the basic concepts of derivatives and integrals. - For students to learn some new pieces of theory (e.g., Lipschitz continuity) and new applications of concepts they already know (e.g., calculations of various volumes). - Students to come into contact with familiar topics such as Taylor polynomials and various numerical methods (Newton, Euler, etc.), which are basic tools in other courses in their studies. – The material should be presented as rigorously as possible in order to strengthen students' ability to think in a structured manner. At the same time, a large number of exercises and examples are provided for better understanding.

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