



METADATA

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Abstract

This book presents a systematic introduction to differential and integral calculus. Special emphasis is placed on basic concepts and definitions, thus offering the possibility of a deep understanding of the concepts of derivative and integral, in direct correspondence to physical quantities and phenomena, as well as to engineering problems. For this purpose, various kinds of problems arising, in particular from the basic definitions of the concept of function, various kinds of functions, monotonicity and exponents, are analyzed in a structured hierarchy. In this way the foundation of the differential calculus is achieved on solid foundations, when the understanding of the necessity and usefulness of the definitions of limit

and rate of change has matured. Based on this background, the introduction to integral calculus is made. The listed material is supplemented by two chapters devoted to the extension of calculus to practical problems in space and time and to the solution of basic differential equations. The ambition of this book is to provide a thorough background of knowledge and problem-solving skills to achieve a deep understanding of the basic definitions of calculus, with an immediate awareness of their necessity in understanding and using natural phenomena. The purpose is to consolidate the theory of calculus as a tool for immediate solution of practical problems, but also to cultivate the intuitive approach from the engineer's side.

