

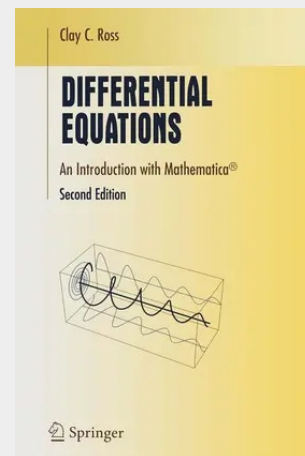
Ross

Differential Equations

An Introduction with Mathematica®

This introductory differential equations book presents a convenient way for professors to integrate symbolic computing into the study of differential equations and linear algebra. Mathematica provides the necessary computational power and is employed from the very beginning of the text. Each new idea is interactively developed using it. All ideas are explored utilizing Mathematica, and though the computer eases the computational burden, the student is encouraged to think about what the computations reveal, how they are consistent with the mathematics, what any conclusions mean, and how they may be applied. This new edition updates the text to Mathematica 5.0 and offers a more extensive treatment of linear algebra.

Goals and Emphasis of the Book Mathematicians have begun to find productive ways to incorporate computing power into the mathematics curriculum. There is no attempt here to use computing to avoid doing differential equations and linear algebra. The goal is to make some first explorations in the subject accessible to students who have had one year of calculus. Some of the sciences are now using the symbol-manipulative power of Mathematica to make more of their subject accessible. This book is one way of doing so for differential equations and linear algebra. I believe that if a student's first exposure to a subject is pleasant and exciting, then that student will seek out ways to continue the study of the subject. The theory of differential equations and of linear algebra permeates the discussion. Every topic is supported by a statement of the theory. But the primary thrust here is obtaining solutions and information about solutions, rather than proving theorems. There are other courses where proving theorems is central. The goals of this text are to establish a solid understanding of the notion of solution, and an appreciation for the confidence that the theory gives during a search for solutions. Later the student can have the same confidence while personally developing the theory.



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