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An introduction to modern mathematical computing. With Mathematica.

Springer Undergraduate Texts in Mathematics and Technology. New York, NY: Springer (ISBN 978-1-4614-4252-3/hbk; 978-1-4614-4253-0/ebook). xvi, 224 p. (2012).

This book looks beyond teaching the syntax and semantics of Mathematica and similar programs, and focuses on why they are necessary tools for anyone who engages in mathematics. It is an essential read for mathematicians, mathematics educators, computer scientists, engineers, scientists, and anyone who wishes to expand their knowledge of mathematics. The material presented in this book is divided into three chapters which cover the following topics: 1. Elementary number theory. This chapter includes the basics of the use of Mathematica, illustrated by fairly simple examples mostly involving integers. Other topics discussed are decision structures, pattern matching, continued fractions and sieve of Eratosthenes. 2. Calculus of one and several variables. The basic ways to plot and explore functions graphically are explored here. 3. Introductory linear algebra. Here it is shown how much of linear algebra can be animated within a computer algebra system. In the final chapter, the authors explore visualization and interactive geometric computation. Each chapter has three main sections forming that chapter's core content. The fourth section of each chapter has exercises and additional examples. The final section of each chapter is intended to provide extra materials for more mathematically advanced readers.

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Classification: N15 I15 H15 G15 R25

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