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DIFFERENTIAL EQUATIONS WITH MAPLE

AN INTERACTIVE APPROACH

Springer Science & Business Media *Differential equations is a subject of wide applicability, and knowledge of dif Differential equations is a subject of wide applicability, and knowledge of dif ferential ferential equations equations topics topics permeates permeates all all areas areas of of study study in in engineering engineering and and applied applied mathematics. mathematics. Some Some differential differential equations equations are are susceptible susceptible to to analytic analytic means means of of so so lution, lution, while while others others require require the the generation generation of of numerical numerical solution solution trajectories trajectories to to see see the the behavior behavior of of the the system system under under study. study. For For both both situations, situations, the the software software package package Maple Maple can can be be used used to to advantage. advantage. To To the the student student Making Making effective effective use use of of differential differential equations equations requires requires facility facility in in recognizing recognizing and and solving solving standard standard "tractable" "tractable" problems, problems, as as well well as as having having the the background background in in the the subject subject to to make make use use of of tools tools for for dealing dealing with with situations situations that that are are not not amenable amenable to to simple simple analytic analytic approaches. approaches.*

THE MAPLE BOOK

CRC Press *Maple is a very powerful computer algebra system used by students, educators, mathematicians, statisticians, scientists, and engineers for doing numerical and symbolic computations. Greatly expanded and updated from the author's MAPLE V Primer, The MAPLE Book offers extensive coverage of the latest version of this outstanding software package, MAPLE 7.0 The MAPLE Book serves both as an introduction to Maple and as a reference. Organized according to level and subject area of mathematics, it first covers the basics of high school algebra and graphing, continues with calculus and differential equations then moves on to more advanced topics, such as linear algebra, vector calculus, complex analysis, special functions, group theory, number theory and combinatorics. The MAPLE Book includes a tutorial for learning the Maple programming language. Once readers have learned how to program, they will appreciate the real power of Maple. The convenient format and straightforward style of The MAPLE Book let users proceed at their own pace, practice with the examples, experiment with graphics, and learn new functions as they need them. All of the Maple commands used in the book are available on the Internet, as are links to various other files referred to in the book. Whatever your level of expertise, you'll want to keep The MAPLE Book next to your computer.*

DYNAMICAL SYSTEMS WITH APPLICATIONS USING MAPLE

Springer Science & Business Media *Since the first edition of this book was published in 2001, Maple™ has evolved from Maple V into Maple 13. Accordingly, this new edition has been thoroughly updated and expanded to include more applications, examples, and exercises, all with solutions; two new chapters on neural networks and simulation have also been added. The author has emphasized breadth of coverage rather than fine detail, and theorems with proof are kept to a minimum. This text is aimed at senior undergraduates, graduate students, and working scientists in various branches of applied mathematics, the natural sciences, and engineering.*

MAPLE V LEARNING GUIDE

Analiza: Como usar el Maple; Matemáticas con Maple; Gráficos; Evaluación y simplificación; Input y output.

MAPLE V FLIGHT MANUAL

TUTORIALS FOR CALCULUS, LINEAR ALGEBRA, AND DIFFERENTIAL EQUATIONS

Brooks/Cole Publishing Company

A GUIDE TO BUSINESS MATHEMATICS

CRC Press *The success of business today is dependent on the knowledge and expertise of its employees. The need for mathematics arises naturally in business such as in the work of the actuary in an insurance company, the financial mathematics required in the day-to-day work of the banker and the need to analyse data to extract useful information to enable the business to make the right decisions to be successful. A Guide to Business Mathematics provides a valuable self-study guide to business practitioners, business students and the general reader to enable them to gain an appropriate insight into the mathematics used in business. This book offers an accessible introduction to essential mathematics for the business field. A wide selection of topics is discussed with the mathematical material presented in a reader-friendly way. The business context motivates the presentation. The author uses modelling and applications to motivate the material, demonstrating how mathematics is used in the financial sector. In addition to the role of the actuary and the banker, the book covers operations research including game theory, trade discounts and the fundamentals of statistics and probability. The book is also a guide to using metrics to manage and measure performance, and business economics. Foundations on algebra, number theory, sequences and series, matrix theory and calculus are included as is a complete chapter on using software. Features*

- *Discusses simple interest and its application to promissory notes/treasury bills.*
- *Discusses compound interest with applications to present and future values.*
- *Introduces the banking field including loans, annuities and the spot/forward FX market.*
- *Discusses trade discounts and markups/markdowns.*
- *Introduces the insurance field and the role of the actuary.*
- *Introduces the fields of data analytics and operations research.*
- *Discusses business metrics and problem solving.*
- *Introduces matrices and their applications.*
- *Discusses calculus and its applications.*
- *Discusses basic financial statements such as balance sheet, profit and loss and cash account.*
- *Reviews a selection of software to support business mathematics.*

This broad-ranging text gives the reader a flavour of the applications of mathematics to the business field and stimulates further study in the subject. As such, it will be of great benefit to business students, while also capturing the interest of the more casual reader. About the Author Dr. Gerard O'Regan is an Assistant Professor in Mathematics at the University of Central Asia in Kyrgyzstan. His research interests include software quality and software process improvement, mathematical approaches to software quality, and the history of computing. He is the author of several books in the Mathematics and Computing fields.

MAPLE V

LEARNING GUIDE

Springer Science & Business Media *Maple V Mathematics Learning Guide is the fully revised introductory documentation for Maple V Release 5. It shows how to use Maple V as a calculator with instant access to hundreds of high-level math routines and as a programming language for more demanding or specialized tasks. Topics include the basic data types and statements in the Maple V language. The book serves as a tutorial introduction and explains the difference between numeric computation and symbolic computation, illustrating how both are used in Maple V Release 5. Extensive "how-to" examples are presented throughout the text to show how common types of calculations can be easily expressed in Maple. Graphics examples are used to illustrate the way in which 2D and 3D graphics can aid in understanding the behaviour of problems.*

MAPLE V BY EXAMPLE

Elsevier *Maple V By Example, Second Edition bridges the gap between the very elementary handbooks addressing Maple V and the reference books written for advanced Maple V users. Whereas the First Edition focuses on Release 2 of Maple V, the vehicle for the Second Edition is Maple V, Version 5. The new edition remains an appropriate reference for all users of Maple V but is of particular value to students, instructors, engineers, business persons, and other professionals first learning to use Maple V.*

INTRODUCTION TO MAPLE

Springer Science & Business Media *The fully revised edition of this best-selling title presents the modern computer algebra system Maple. It teaches the reader not only what can be done by Maple but also how and why it can be done. It provides the necessary background for those who want the most of Maple or want to extend its built-in knowledge, and it includes both elementary and more sophisticated examples as well as many exercises.*

MAPLE® FOR ENVIRONMENTAL SCIENCES

A HELPING HAND

Springer Science & Business Media *A presentation of what Maple can do and how it does it in the context of environmental sciences. The text includes introductory tutorials in each chapter combined with extensive marginal comments which are followed by a complete application. These include the contouring of water table data, the physical chemistry of kidney stones, and acid rain. The book also provides a special application to enable students to use "self help" in the case that Maple seem unable to do the simplest things.*

MAPLE 8 LEARNING GUIDE

SOLVING DIFFERENTIAL EQUATIONS WITH MAPLE V, RELEASE 4

Brooks Cole *This comprehensive book helps students tap into the power of Maple®, thereby simplifying the computations and graphics that are often required in the practical use of mathematics. Numerous examples and exercises provide a thorough introduction to the basic Maple® commands that are needed to solve differential equations. Topics include: numerical algorithms, first order linear systems, homogeneous and nonhomogeneous equations, beats and resonance, Laplace Transforms, qualitative theory, nonlinear systems, and much more.*

MAPLE

PROGRAMMING, PHYSICAL AND ENGINEERING PROBLEMS

Fultus Corporation *The book consists of two parts. The first part consists of seven chapters and presents a new software for package Maple of releases 6-10. The tools represented in this chapters increase the range and efficiency of use of Maple on Windows platform. The basic attention is devoted to additional tools created in the process of practical use and testing the Maple of releases 4 - 10 which by some parameters extend essentially the opportunities of the package and facilitate the work with it. Whereas the algorithms of physical and engineering problems of the second part mainly use the finite element method (FEM). The part consists of eight chapters and solves in Maple environment the physical and engineering problems from such fields as: thermal conductivity, mechanics of deformable bodies, theory of elasticity, hydrodynamics, hydromechanics, etc. At last, application of Maple for solution of optimization problems is presented.*

THEOREM PROVING IN HIGHER ORDER LOGICS

14TH INTERNATIONAL CONFERENCE, TPHOLS 2001, EDINBURGH, SCOTLAND, UK, SEPTEMBER 3-6, 2001. PROCEEDINGS

Springer *This volume constitutes the proceedings of the 14th International Conference on Theorem Proving in Higher Order Logics (TPHOLS 2001) held 3-6 September 2001 in Edinburgh, Scotland. TPHOLS covers all aspects of theorem proving in higher order logics, as well as related topics in theorem proving and veri?cation. TPHOLS 2001 was collocated with the 11th Advanced Research Working Conference on Correct Hardware Design and Veri?cation Methods (CHARME 2001). This was held 4-7 September 2001 in nearby Livingston, Scotland at the Institute for System Level Integration, and a joint half-day session of talks was arranged for the 5th September in Edinburgh. An excursion to Traquair House and a banquet in the Playfair Library of Old College, University of Edinburgh were also jointly organized. The proceedings of CHARME 2001 have been p- lished as volume 2144 of Springer-Verlag's Lecture Notes in Computer Science series, with Tiziana Margaria and Tom Melham as editors. Each of the 47 papers submitted in the full research category was refereed by at least 3 reviewers who were selected by the Program Committee. Of these submissions, 23 were accepted for presentation at the conference and publication in this volume. In keeping with tradition, TPHOLS 2001 also o?ered a venue for the presentation of work in progress, where researchers invite discussion by means of a brief preliminary talk and then discuss their work at a poster session. A supplementary proceedings containing associated papers for work in progress was published by the Division of Informatics at the University of Edinburgh.*

A BIOLOGIST'S GUIDE TO MATHEMATICAL MODELING IN ECOLOGY AND EVOLUTION

Princeton University Press *Thirty years ago, biologists could get by with a rudimentary grasp of mathematics and modeling. Not so today. In seeking to answer fundamental questions about how biological systems function and change over time, the modern biologist is as likely to rely on sophisticated mathematical and computer-based models as traditional fieldwork. In this book, Sarah Otto and Troy Day provide biology students with the tools necessary to both interpret models and to build their own. The book starts at an elementary level of mathematical modeling, assuming that the reader has had high school mathematics and first-year calculus. Otto and Day then gradually build in depth and complexity, from classic models in ecology and evolution to more intricate class-structured and probabilistic models. The authors provide primers with instructive exercises to introduce readers to the more advanced subjects of linear algebra and probability theory. Through examples, they describe how models have been used to understand such topics as the spread of HIV, chaos, the age structure of a country, speciation, and extinction. Ecologists and evolutionary biologists today need enough mathematical training to be able to assess the power and limits of biological models and to develop theories and models themselves. This innovative book will be an indispensable guide to the world of mathematical models for the next generation of biologists. A how-to guide for developing new mathematical models in biology Provides step-by-step recipes for constructing and analyzing models Interesting biological applications Explores classical models in ecology and evolution Questions at the end of every chapter Primers cover important mathematical topics Exercises with answers Appendixes summarize useful rules Labs and advanced material available*

HANDBOOK OF NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS, SECOND EDITION

CRC Press *New to the Second Edition More than 1,000 pages with over 1,500 new first-, second-, third-, fourth-, and higher-order nonlinear equations with solutions Parabolic, hyperbolic, elliptic, and other systems of equations with solutions Some exact methods and transformations Symbolic and numerical methods for solving nonlinear PDEs with Maple™, Mathematica®, and MATLAB® Many new illustrative examples and tables A large list of references consisting of over 1,300 sources To accommodate different mathematical backgrounds, the authors avoid wherever possible the use of special terminology. They outline the methods in a schematic, simplified manner and arrange the material in increasing order of complexity.*

THE MAPLE HANDBOOK

MAPLE V RELEASE 4

Springer Science & Business Media *An essential reference tool for all users of the Maple system, providing a complete listing of every command in the Maple language, categorised into logical categories and explained in this context. A short, introductory tutorial starts the Handbook, and each category begins with a brief introduction to the related subject area. It is well referenced, with an alphabetical index of commands, and pointers to appropriate sections of the official Maple documentation. This new approach to reference material enhances that found in Maples on-line help files and provides a much more organised, intuitive resource for all users of the system. The Handbook improves efficiency by supplying users with the information they need - at their fingertips. This new edition covers the Maple V Release 4 symbolic computation language.*

A GUIDE TO MAPLE

Springer Science & Business Media *This "hands-on" book is for people who are interested in immediately putting Maple to work. The reader is provided with a compact, fast and surveyable guide that introduces them to the extensive capabilities of the software. The book is sufficient for standard use of Maple and will provide techniques for extending Maple for more specialized work. The author discusses the reliability of results systematically and presents ways of testing questionable results. The book allows a reader to become a user almost immediately and helps him/her to grow gradually to a broader and more proficient use. As a consequence, some subjects are dealt with in an introductory way early in the book, with references to a more detailed discussion later on.*

COMPUTER ALGEBRA RECIPES FOR MATHEMATICAL PHYSICS

Springer Science & Business Media ** Uses a pedagogical approach that makes a mathematically challenging subject easier and more fun to learn * Self-contained and standalone text that may be used in the classroom, for an online course, for self-study, as a reference * Using MAPLE allows the reader to easily and quickly change the models and parameters*

NUMERICAL MATHEMATICS AND COMPUTING

Cengage Learning *Authors Ward Cheney and David Kincaid show students of science and engineering the potential computers have for solving numerical problems and give them ample opportunities to*

hone their skills in programming and problem solving. *NUMERICAL MATHEMATICS AND COMPUTING*, 7th Edition also helps students learn about errors that inevitably accompany scientific computations and arms them with methods for detecting, predicting, and controlling these errors. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

GUIDE TO SIMULATION AND MODELING FOR BIOSCIENCES

Springer This accessible text presents a detailed introduction to the use of a wide range of software tools and modeling environments for use in the biosciences, as well as the fundamental mathematical background. The practical constraints presented by each modeling technique are described in detail, enabling the researcher to determine which software package would be most useful for a particular problem. Features: introduces a basic array of techniques to formulate models of biological systems, and to solve them; discusses agent-based models, stochastic modeling techniques, differential equations, spatial simulations, and Gillespie's stochastic simulation algorithm; provides exercises; describes such useful tools as the Maxima algebra system, the PRISM model checker, and the modeling environments Repast Symphony and Smoldyn; contains appendices on rules of differentiation and integration, Maxima and PRISM notation, and some additional mathematical concepts; offers supplementary material at an associated website.

ADVANCES IN REAL AND COMPLEX ANALYSIS WITH APPLICATIONS

Birkhäuser This book discusses a variety of topics in mathematics and engineering as well as their applications, clearly explaining the mathematical concepts in the simplest possible way and illustrating them with a number of solved examples. The topics include real and complex analysis, special functions and analytic number theory, q -series, Ramanujan's mathematics, fractional calculus, Clifford and harmonic analysis, graph theory, complex analysis, complex dynamical systems, complex function spaces and operator theory, geometric analysis of complex manifolds, geometric function theory, Riemannian surfaces, Teichmüller spaces and Kleinian groups, engineering applications of complex analytic methods, nonlinear analysis, inequality theory, potential theory, partial differential equations, numerical analysis, fixed-point theory, variational inequality, equilibrium problems, optimization problems, stability of functional equations, and mathematical physics. It includes papers presented at the 24th International Conference on Finite or Infinite Dimensional Complex Analysis and Applications (24ICFIDCAA), held at the Anand International College of Engineering, Jaipur, 22-26 August 2016. The book is a valuable resource for researchers in real and complex analysis.

COMPUTER ALGEBRA IN SCIENTIFIC COMPUTING CASC'99

PROCEEDINGS OF THE SECOND WORKSHOP ON COMPUTER ALGEBRA IN SCIENTIFIC COMPUTING, MUNICH, MAY 31 - JUNE 4, 1999

Springer Science & Business Media The development of powerful computer algebra systems has considerably extended the scope of problems of scientific computing which can now be solved successfully with the aid of computers. However, as the field of applications of computer algebra in scientific computing becomes broader and more complex, there is a danger of separation between theory, systems, and applications. For this reason, we felt the need to bring together the researchers who now apply the tools of computer algebra for the solution of problems in scientific computing, in order to foster new and closer interactions. CASC'99 is the second conference devoted to applications of computer algebra in scientific computing. The first conference in this sequence, CASC'98, was held 20-24 April 1998 in St. Petersburg, Russia. This volume contains revised versions of the papers submitted by the participants and accepted by the program committee after a thorough reviewing process. The collection of papers included in the proceedings covers various topics of computer algebra methods, algorithms and software applied to scientific computing: symbolic-numeric analysis and solving differential equations, efficient computations with polynomials, groups, matrices and other related objects, special purpose programming environments, application to physics, mechanics, optics and to other areas. In particular, a significant group of papers deals with applications of computer algebra methods for the solution of current problems in group theory, which mostly arise in mathematical physics.

ELEMENTARY DIFFERENTIAL EQUATIONS AND BOUNDARY VALUE PROBLEMS

John Wiley & Sons

GUIDE TO INFORMATION SOURCES IN MATHEMATICS AND STATISTICS

Libraries Unlimited Publisher description: This book is a reference for librarians, mathematicians, and statisticians involved in college and research level mathematics and statistics in the 21st century. Part I is a historical survey of the past 15 years tracking this huge transition in scholarly communications in mathematics. Part II of the book is the bibliography of resources recommended to support the

disciplines of mathematics and statistics. These resources are grouped by material type. Publication dates range from the 1800's onwards. Hundreds of electronic resources-some online, both dynamic and static, some in fixed media, are listed among the paper resources. A majority of listed electronic resources are free.

PARTIAL DIFFERENTIAL EQUATIONS OF APPLIED MATHEMATICS

John Wiley & Sons This new edition features the latest tools for modeling, characterizing, and solving partial differential equations The Third Edition of this classic text offers a comprehensive guide to modeling, characterizing, and solving partial differential equations (PDEs). The author provides all the theory and tools necessary to solve problems via exact, approximate, and numerical methods. The Third Edition retains all the hallmarks of its previous editions, including an emphasis on practical applications, clear writing style and logical organization, and extensive use of real-world examples. Among the new and revised material, the book features: * A new section at the end of each original chapter, exhibiting the use of specially constructed Maple procedures that solve PDEs via many of the methods presented in the chapters. The results can be evaluated numerically or displayed graphically. * Two new chapters that present finite difference and finite element methods for the solution of PDEs. Newly constructed Maple procedures are provided and used to carry out each of these methods. All the numerical results can be displayed graphically. * A related FTP site that includes all the Maple code used in the text. * New exercises in each chapter, and answers to many of the exercises are provided via the FTP site. A supplementary Instructor's Solutions Manual is available. The book begins with a demonstration of how the three basic types of equations-parabolic, hyperbolic, and elliptic-can be derived from random walk models. It then covers an exceptionally broad range of topics, including questions of stability, analysis of singularities, transform methods, Green's functions, and perturbation and asymptotic treatments. Approximation methods for simplifying complicated problems and solutions are described, and linear and nonlinear problems not easily solved by standard methods are examined in depth. Examples from the fields of engineering and physical sciences are used liberally throughout the text to help illustrate how theory and techniques are applied to actual problems. With its extensive use of examples and exercises, this text is recommended for advanced undergraduates and graduate students in engineering, science, and applied mathematics, as well as professionals in any of these fields. It is possible to use the text, as in the past, without use of the new Maple material.

INTERACTIVE OPERATIONS RESEARCH WITH MAPLE

METHODS AND MODELS

Springer Science & Business Media Interactive Operations Research with Maple: Methods and Models has two objectives: to provide an accelerated introduction to the computer algebra system Maple and, more importantly, to demonstrate Maple's usefulness in modeling and solving a wide range of operations research (OR) problems. This book is written in a format that makes it suitable for a one-semester course in operations research, management science, or quantitative methods. A number of students in the departments of operations research, management science, operations management, industrial and systems engineering, applied mathematics and advanced MBA students who are specializing in quantitative methods or operations management will find this text useful. Experienced researchers and practitioners of operations research who wish to acquire a quick overview of how Maple can be useful in solving OR problems will find this an excellent reference. Maple's mathematical knowledge base now includes calculus, linear algebra, ordinary and partial differential equations, number theory, logic, graph theory, combinatorics, statistics and transform methods. Although Maple's main strength lies in its ability to perform symbolic manipulations, it also has a substantial knowledge of a large number of numerical methods and can plot many different types of attractive-looking two-dimensional and three-dimensional graphs. After almost two decades of continuous improvement of its mathematical capabilities, Maple can now boast a user base of more than 300,000 academics, researchers and students in different areas of mathematics, science and engineering.

SOLVING DIFFERENTIAL EQUATIONS IN R

Springer Science & Business Media Mathematics plays an important role in many scientific and engineering disciplines. This book deals with the numerical solution of differential equations, a very important branch of mathematics. Our aim is to give a practical and theoretical account of how to solve a large variety of differential equations, comprising ordinary differential equations, initial value problems and boundary value problems, differential algebraic equations, partial differential equations and delay differential equations. The solution of differential equations using R is the main focus of this book. It is therefore intended for the practitioner, the student and the scientist, who wants to know how to use R for solving differential equations. However, it has been our goal that non-mathematicians should at least understand the basics of the methods, while obtaining entrance into the relevant literature that provides more mathematical background. Therefore, each chapter that deals with R examples is preceded by a chapter where the theory behind the numerical methods being used is introduced. In the sections that deal with the use of R for solving differential equations, we have taken examples from a variety of disciplines, including biology, chemistry, physics, pharmacokinetics. Many examples are well-known test examples, used frequently in the field of numerical analysis.

COMPUTER-AIDED ANALYSIS OF DIFFERENCE SCHEMES FOR PARTIAL DIFFERENTIAL EQUATIONS

John Wiley & Sons Advances in computer technology have conveniently coincided with trends in numerical analysis toward increased complexity of computational algorithms based on finite difference methods. It is no longer feasible to perform stability investigation of these methods manually--and no longer necessary. As this book shows, modern computer algebra tools can be combined with methods from numerical analysis to generate programs that will do the job automatically. Comprehensive, timely, and accessible--this is the definitive reference on the application of computerized symbolic manipulations for analyzing the stability of a wide range of difference schemes. In particular, it deals with those schemes that are used to solve complex physical problems in areas such as gas dynamics, heat and mass transfer, catastrophe theory, elasticity, shallow water theory, and more. Introducing many new applications, methods, and concepts, *Computer-Aided Analysis of Difference Schemes for Partial Differential Equations* * Shows how computational algebra expedites the task of stability analysis--whatever the approach to stability investigation * Covers ten different approaches for each stability method * Deals with the specific characteristics of each method and its application to problems commonly encountered by numerical modelers * Describes all basic mathematical formulas that are necessary to implement each algorithm * Provides each formula in several global algebraic symbolic languages, such as MAPLE, MATHEMATICA, and REDUCE * Includes numerous illustrations and thought-provoking examples throughout the text For mathematicians, physicists, and engineers, as well as for postgraduate students, and for anyone involved with numeric solutions for real-world physical problems, this book provides a valuable resource, a helpful guide, and a head start on developments for the twenty-first century.

DYNAMICAL SYSTEMS

ANALYTICAL AND COMPUTATIONAL TECHNIQUES

BoD - Books on Demand There has been a considerable progress made during the recent past on mathematical techniques for studying dynamical systems that arise in science and engineering. This progress has been, to a large extent, due to our increasing ability to mathematically model physical processes and to analyze and solve them, both analytically and numerically. With its eleven chapters, this book brings together important contributions from renowned international researchers to provide an excellent survey of recent advances in dynamical systems theory and applications. The first section consists of seven chapters that focus on analytical techniques, while the next section is composed of four chapters that center on computational techniques.

DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA

OUP USA *Differential Equations with Linear Algebra* explores the interplay between linear algebra and differential equations by examining fundamental problems in elementary differential equations. With an example-first style, the text is accessible to students who have completed multivariable calculus and is appropriate for courses in mathematics and engineering that study systems of differential equations.

PARTIAL DIFFERENTIAL EQUATIONS FOR COMPUTATIONAL SCIENCE

WITH MAPLE AND VECTOR ANALYSIS

Springer Science & Business Media This book will have strong appeal to interdisciplinary audiences, particularly in regard to its treatments of fluid mechanics, heat equations, and continuum mechanics. There is also a heavy focus on vector analysis. Maple examples, exercises, and an appendix is also included.

PROGRAMMING LANGUAGES AND SYSTEMS IN COMPUTATIONAL ECONOMICS AND FINANCE

Springer Science & Business Media The developments within the computationally and numerically oriented areas of Operations Research, Finance, Statistics and Economics have been significant over the past few decades. Each area has been developing its own computer systems and languages that suit its needs, but there is relatively little cross-fertilization among them yet. This volume contains a collection of papers that each highlights a particular system, language, model or paradigm from one of the computational disciplines, aimed at researchers and practitioners from the other fields. The 15 papers cover a number of relevant topics: Models and Modelling in Operations Research and Economics, novel High-level and Object-Oriented approaches to programming, through advanced uses of Maple and MATLAB, and applications and solution of Differential Equations in Finance. It is hoped that the material in this volume will whet the reader's appetite for discovering and exploring new approaches to old problems, and in the longer run facilitate cross-fertilization among the fields. We would like to thank the contributing authors, the reviewers, the publisher, and last, but not least, Jesper Saxtorph, Anders Nielsen, and Thomas Stidsen for invaluable technical assistance.

HOMOTOPY ANALYSIS METHOD IN NONLINEAR DIFFERENTIAL EQUATIONS

Springer Science & Business Media "Homotopy Analysis Method in Nonlinear Differential Equations" presents the latest developments and applications of the analytic approximation method for highly nonlinear problems, namely the homotopy analysis method (HAM). Unlike perturbation methods, the HAM has nothing to do with small/large physical parameters. In addition, it provides great freedom to choose the equation-type of linear sub-problems and the base functions of a solution. Above all, it provides a convenient way to guarantee the convergence of a solution. This book consists of three parts. Part I provides its basic ideas and theoretical development. Part II presents the HAM-based Mathematica package BVPh 1.0 for nonlinear boundary-value problems and its applications. Part III shows the validity of the HAM for nonlinear PDEs, such as the American put option and resonance criterion of nonlinear travelling waves. New solutions to a number of nonlinear problems are presented, illustrating the originality of the HAM. Mathematica codes are freely available online to make it easy for readers to understand and use the HAM. This book is suitable for researchers and postgraduates in applied mathematics, physics, nonlinear mechanics, finance and engineering. Dr. Shijun Liao, a distinguished professor of Shanghai Jiao Tong University, is a pioneer of the HAM.

MATHEMATICAL SOFTWARE - ICMS 2006

SECOND INTERNATIONAL CONGRESS ON MATHEMATICAL SOFTWARE, CASTRO URDIALES, SPAIN, SEPTEMBER 1-3, 2006, PROCEEDINGS

Springer Science & Business Media This book constitutes the refereed proceedings of the Second International Congress on Mathematical Software, ICMS 2006. The book presents 45 revised full papers, carefully reviewed and selected for presentation. The papers are organized in topical sections on new developments in computer algebra packages, interfacing computer algebra in mathematical visualization, software for algebraic geometry and related topics, number-theoretical software, methods in computational number theory, free software for computer algebra, and general issues.

ADVANCED ENGINEERING MATHEMATICS

John Wiley & Sons A mathematics resource for engineering, physics, math, and computer science students The enhanced e-text, *Advanced Engineering Mathematics, 10th Edition*, is a comprehensive book organized into six parts with exercises. It opens with ordinary differential equations and ends with the topic of mathematical statistics. The analysis chapters address: Fourier analysis and partial differential equations, complex analysis, and numeric analysis. The book is written by a pioneer in the field of applied mathematics.

DIFFERENTIAL EQUATIONS

A SYSTEMS APPROACH

Written for beginners, this well organized introduction promotes a solid understanding of differential equations that is flexible enough to meet the needs of many different disciplines. With less emphasis on formal calculation than found in other books all the basic methods are covered—first order equations, separation, exact form, and linear equations—as well as higher order cases, linear equation with constant and variable coefficients, Laplace transform methods, and boundary value problems. The book's systems focus induces an intuitive understanding of the concept of a solution of an initial value problem in order to resolve potential confusion about what is being approximated when a numerical method is used. The author outlines first order equations including linear and nonlinear equations and systems of differential equations, as well as linear differential equations including the Laplace transform, and variable coefficients, nonlinear differential equations, and boundary problems and PDEs. For those looking for a solid introduction to differential equations.

A GUIDE TO CALCULUS T/L II

A PROGRAM FOR DOING AND LEARNING CALCULUS

Thomson Brooks/Cole

KLIATT YOUNG ADULT PAPERBACK BOOK GUIDE

COMPUTER ALGEBRA RECIPES

A GOURMET'S GUIDE TO THE MATHEMATICAL MODELS OF SCIENCE

Springer Science & Business Media *Computer algebra systems allow students to work on mathematical models more efficiently than in the case of pencil and paper. The use of such systems also leads to fewer errors and enables students to work on complex and computationally intensive models. Aimed at undergraduates in their second or third year, this book is filled with examples from a wide variety of disciplines, including biology, economics, medicine, engineering, game theory, physics, and chemistry. The text includes a large number of Maple(R) recipes.*