Mathematica Beyond Mathematics The Wolfram Langua

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A Student's Guide to the Schrödinger Equation Daniel A. Fleisch 2020-02-20 A clear guide to the key concepts and mathematical techniques underlying the Schrödinger equation, including homework problems and fully worked solutions.

A Mathematica Primer for Physicists Jim Napolitano 2018-03-22 "...an excellent text for either a short course or self-study... Professor Napolitano has figured out what students really need, and found a way to deliver it... I have found everything he writes to be worthy of my serious attention..." —Peter D. Persans, Professor of Physics and Director, Center for Integrated Electronics, Rensselaer Polytechnic Institute Learn how to use Mathematica quickly for basic problems in physics. The author introduces all the key techniques and then shows how they're applied using common examples. Chapters cover elementary mathematics concepts, differential and integral calculus, differential equations, vectors and matrices, data analysis, random number generation, animation, and visualization. Written in an appealing, conversational style Presents important concepts within the framework of Mathematics Gives examples from frequently encountered physics problems Explains problem-solving in a step-by-step fashion Jim Napolitano is professor and chair in the Department of Physics at Temple University. He is the author of other textbooks, including co-author with Alistair Rae of Quantum Mechanics, Sixth Edition, also published by Taylor & Francis / CRC Press.

A History of Mathematical Notations Florian Cajori 2013-09-26 This classic study notes the origin of a mathematical symbol, the competition it encountered, its spread among writers in different countries, its rise to popularity, and its eventual decline or ultimate survival. 1929 edition.

Computer Modeling and Simulation of Dynamic Systems Using Wolfram SystemModeler Kirill Rozhdestvensky 2020-03-20 This book briefly discusses the main provisions of the theory of modeling. It also describes in detail the methodology for

constructing computer models of dynamic systems using the Wolfram visual modeling environment, SystemModeler, and provides illustrative examples of solving problems of mechanics and hydraulics. Intended for students and professionals in the field, the book also serves as a supplement to university courses in modeling and simulation of dynamic systems.

Principia Mathematica Alfred North Whitehead 1910

MATLAB Primer, Eighth Edition Timothy A. Davis 2010-08-18 Highlighting the new aspects of MATLAB® 7.10 and expanding on many existing features, MATLAB® Primer, Eighth Edition shows you how to solve problems in science, engineering, and mathematics. Now in its eighth edition, this popular primer continues to offer a hands-on, step-by-step introduction to using the powerful tools of MATLAB. New to the Eighth Edition A new chapter on object-oriented programming Discussion of the MATLAB File Exchange window, which provides direct access to over 10,000 submissions by MATLAB users Major changes to the MATLAB Editor, such as code folding and the integration of the Code Analyzer (M-Lint) into the Editor Explanation of more powerful Help tools, such as quick help popups for functions via the Function Browser The new bsxfun function A synopsis of each of the MATLAB Top 500 most frequently used functions, operators, and special characters The addition of several useful features, including sets, logical indexing, isequal, repmat, reshape, varargin, and varargout The book takes you through a series of simple examples that become progressively more complex. Starting with the core components of the MATLAB desktop, it demonstrates how to handle basic matrix operations and expressions in MATLAB. The text then introduces commonly used functions and explains how to write your own functions, before covering advanced features, such as object-oriented programming, calling other languages from MATLAB, and MATLAB graphics. It also presents an in-depth look at the Symbolic Toolbox, which solves problems analytically rather than numerically.

An Elementary Introduction to the Wolfram Language Stephen Wolfram 2017 The Wolfram Language represents a major advance in programming languages that makes leading-edge computation accessible to everyone. Unique in its approach of building in vast knowledge and automation, the Wolfram Language scales from a single line of easy-to-understand interactive code to million-line production systems. This book provides an elementary introduction to the Wolfram Language and modern computational thinking. It assumes no prior knowledge of programming, and is suitable for both technical and non-technical college and high-school students, as well as anyone with an interest in the latest technology and its practical application.

A Project to Find the Fundamental Theory of Physics Stephen Wolfram 2020 The Wolfram Physics Project is a bold effort to find the fundamental theory of physics. It combines new ideas with the latest research in physics, mathematics and computation in the push to achieve this ultimate goal of science. Written with Stephen Wolfram's characteristic expository flair, this book provides a unique opportunity to learn about a historic initiative in science right as it is happening. A Project to Find the Fundamental Theory of Physics includes an accessible introduction to the project as well as core technical exposition and rich, never-before-seen visualizations.

Idea Makers Stephen Wolfram 2016-07-07 This book of thoroughly engaging essays from one of today's most prodigious innovators provides a uniquely personal perspective on the

lives and achievements of a selection of intriguing figures from the history of science and technology. Weaving together his immersive interest in people and history with insights gathered from his own experiences, Stephen Wolfram gives an ennobling look at some of the individuals whose ideas and creations have helped shape our world today. Contents includes biographical sketches of: Richard Feynman Kurt Godel Alan Turing John von Neumann George Boole Ada Lovelace Gottfried Leibniz Benoit Mandelbrot Steve Jobs Marvin Minsky Russell Towle Bertrand Russell Alfred Whitehead Richard Crandall Srinivasa Ramanujan Solomon Golomb

Introduction to Mathematical Modeling and Computer Simulations Vladimir Mityushev 2018-02-19 Introduction to Mathematical Modeling and Computer Simulations is written as a textbook for readers who want to understand the main principles of Modeling and Simulations in settings that are important for the applications, without using the profound mathematical tools required by most advanced texts. It can be particularly useful for applied mathematicians and engineers who are just beginning their careers. The goal of this book is to outline Mathematical Modeling using simple mathematical descriptions, making it accessible for first- and second-year students. Chapter 1 and the Preface of this book is freely available as a downloadable Open Access PDF under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license available at http://www.taylorfrancis.com/books/e/9781315277240

Mathematica Navigator Heikki Ruskeepaa 2004-02-06 Mathematica Navigator gives you a general introduction to Mathematica. The book emphasizes graphics, methods of applied mathematics and statistics, and programming. Mathematica Navigator can be used both as a tutorial and as a handbook. While no previous experience with Mathematica is required, most chapters also include advanced material, so that the book will be a valuable resource for both beginners and experienced users.

Using Mathematica for Quantum Mechanics Roman Schmied 2019-09-28 This book revisits many of the problems encountered in introductory quantum mechanics, focusing on computer implementations for finding and visualizing analytical and numerical solutions. It subsequently uses these implementations as building blocks to solve more complex problems, such as coherent laser-driven dynamics in the Rubidium hyperfine structure or the Rashba interaction of an electron moving in 2D. The simulations are highlighted using the programming language Mathematica. No prior knowledge of Mathematica is needed; alternatives, such as Matlab, Python, or Maple, can also be used.

Mathematica®: A Problem-Centered Approach Roozbeh Hazrat 2016-01-04 This textbook introduces the vast array of features and powerful mathematical functions of Mathematica using a multitude of clearly presented examples and worked-out problems. Each section starts with a description of a new topic and some basic examples. The author then demonstrates the use of new commands through three categories of problems - the first category highlights those essential parts of the text that demonstrate the use of new commands in Mathematica whilst solving each problem presented; - the second comprises problems that further demonstrate the use of commands previously introduced to tackle different situations; and - the third presents more challenging problems for further study. The intention is to enable the reader to learn from the codes, thus avoiding long and exhausting explanations. While based on a computer algebra course taught to undergraduate students of

mathematics, science, engineering and finance, the book also includes chapters on calculus and solving equations, and graphics, thus covering all the basic topics in Mathematica. With its strong focus upon programming and problem solving, and an emphasis on using numerical problems that do not need any particular background in mathematics, this book is also ideal for self-study and as an introduction to researchers who wish to use Mathematica as a computational tool. This new edition has been extensively revised and updated, and includes new chapters with problems and worked examples.

Mathematica Beyond Mathematics José Guillermo Sánchez León 2022-12-19 Although many books have been written about Mathematica, very few of them cover the new functionality added to the most recent versions of the program. This thoroughly revised second edition of Mathematica Beyond Mathematics: The Wolfram Language in the Real World introduces the new features using real-world examples based on the experience of the author as a consultant and Wolfram certified instructor. The examples strike a balance between relevance and difficulty in terms of Mathematica syntax, allowing readers to incrementally build up their Mathematica skills as they go through the chapters While reading this book, you will also learn more about the Wolfram Language and how to use it to solve a wide variety of problems. The author raises questions from a wide range of topics and answers them by taking full advantage of Mathematica's latest features. For example: What sources of energy does the world really use? Are our cities getting warmer? Is the novel El Quixote written in Pi? Is it possible to reliably date the Earth using radioactive isotopes? How can we find planets outside our solar system? How can we model epidemics, earthquakes and other natural phenomena? What is the best way to compare organisms genetically? This new edition introduces the new capabilities added to the latest version of Mathematica (version 13), and discusses new topics related to machine learning, big data, finance economics, and physics. New to the Second Edition Separate sections containing carefully selected additional resources that can be accessed from either Mathematica or online Online Supplementary materials including code snippets used in the book and additional examples. Updated commands to take full advantage of Mathematica 13.

Complex Analysis for Mathematics and Engineering John H. Mathews 1996 This text provides a balance between pure (theoretical) and applied aspects of complex analysis. The many applications of complex analysis to science and engineering are described, and this third edition contains a historical introduction depicting the origins of complex numbers.

Exploring Analytic Geometry with Mathematica Donald L. Vossler 2000 The study of two-dimensional analytic geometry has gone in and out of fashion several times over the past century, however this classic field of mathematics has once again become popular due to the growing power of personal computers and the availability of powerful mathematical software systems, such as Mathematica, that can provide an interactive environment for studying the field. By combining the power of Mathematica with an analytic geometry software system called Descarta2D, the author has succeeded in meshing an ancient field of study with modern computational tools, the result being a simple, yet powerful, approach to studying analytic geometry. Students, engineers and mathematicians alike who are interested in analytic geometry can use this book and software for the study, research or just plain enjoyment of analytic geometry. Mathematica provides an attractive environment for studying analytic geometry. Mathematica supports both numeric and symbolic computations meaning that geometry problems can be solved for special cases using numbers, as well as

general cases producing formulas. Mathematica also has good facilities for producing graphical plots which are useful for visualizing the graphs of two-dimensional geometry. * A classic study in analytic geometry, complete with in-line Mathematica dialogs illustrating every concept as it is introduced * Excellent theoretical presentation *Fully explained examples of all key concepts * Interactive Mathematica notebooks for the entire book * Provides a complete computer-based environment for study of analytic geometry * All chapters and reference material are provided on CD-ROM in addition to being printedin the book * Complete software system: Descarta2D * A software system, including source code, for the underlying computer implementation, called Descarta2D is provided * Part VII of the book is a listing of the (30) Mathematica files supporting Descarta2D; the source code is also supplied on CD-ROM * Explorations * More than 120 challenging problems in analytic geometry are posed; Complete solutions are provided both as interactive Mathematica notebooks on CD-ROM and as printed material in the book * Mathematica and Descarta2D Hints expand the reader's knowledge and understanding of Descarta2D and Mathematica * Sortware developed with Mathematica 3.0 and is compatible with Mathematica 4.0 * Detailed reference manual * Complete documentation for Descarta2D * Fully integrated into the Mathematica Help Browser

Computer Science with MATHEMATICA ® Roman Maeder 2000-02-28 This introductory course shows scientists and engineers how Mathematica can be used to do scientific computations.

Advanced Calculus Explored 2019-11-29

Mathematica by Example Martha L Abell 2014-05-09 Mathematica by Example presents the commands and applications of Mathematica, a system for doing mathematics on a computer. This text serves as a guide to beginning users of Mathematica and users who do not intend to take advantage of the more specialized applications of Mathematica. The book combines symbolic manipulation, numerical mathematics, outstanding graphics, and a sophisticated programming language. It is comprised of 10 chapters. Chapter 1 gives a brief background of the software and how to install it in the computer. Chapter 2 introduces the essential commands of Mathematica. Basic operations on numbers, expressions, and functions are introduced and discussed. Chapter 3 provides Mathematica's built-in calculus commands. The fourth chapter presents elementary operations on lists and tables. This chapter is a prerequisite for Chapter 5 which discusses nested lists and tables in detail. The purpose of Chapter 6 is to illustrate various computations Mathematica can perform when solving differential equations. Chapters 7, 8, and 9 introduce Mathematica Packages that are not found in most Mathematica reference book. The final chapter covers the Mathematica Help feature. Engineers, computer scientists, physical scientists, mathematicians, business professionals, and students will find the book useful.

New Kind of Science Stephen Wolfram 2002-12-01

A Beginner's Guide To Mathematica David McMahon 2006-01-13 Because of its large command structure and intricate syntax, Mathematica can be difficult to learn. Wolfram's Mathematica manual, while certainly comprehensive, is so large and complex that when trying to learn the software from scratch -- or find answers to specific questions -- one can be quickly overwhelmed. A Beginner's Guide to Mathemat

Introduction to Chemical Engineering Analysis Using Mathematica Henry C. Foley 2021-06-16 Introduction to Chemical Engineering Analysis Using Mathematica, Second Edition reviews the processes and designs used to manufacture, use, and dispose of chemical products using Mathematica, one of the most powerful mathematical software tools available for symbolic, numerical, and graphical computing. Analysis and computation are explained simultaneously. The book covers the core concepts of chemical engineering, ranging from the conservation of mass and energy to chemical kinetics. The text also shows how to use the latest version of Mathematica, from the basics of writing a few lines of code through developing entire analysis programs. This second edition has been fully revised and updated, and includes analyses of the conservation of energy, whereas the first edition focused on the conservation of mass and ordinary differential equations. Offers a fully revised and updated new edition, extended with conservation of energy Covers a large number of topics in chemical engineering analysis, particularly for applications to reaction systems Includes many detailed examples Contains updated and new worked problems at the end of the book Written by a prominent scientist in the field

Irreducibility and Computational Equivalence Hector Zenil 2012-12-25 It is clear that computation is playing an increasingly prominent role in the development of mathematics, as well as in the natural and social sciences. The work of Stephen Wolfram over the last several decades has been a salient part in this phenomenon helping founding the field of Complex Systems, with many of his constructs and ideas incorporated in his book A New Kind of Science (ANKS) becoming part of the scientific discourse and general academic knowledge-- from the now established Elementary Cellular Automata to the unconventional concept of mining the Computational Universe, from today's widespread Wolfram's Behavioural Classification to his principles of Irreducibility and Computational Equivalence. This volume, with a Foreword by Gregory Chaitin and an Afterword by Cris Calude, covers these and other topics related to or motivated by Wolfram's seminal ideas, reporting on research undertaken in the decade following the publication of Wolfram's NKS book. Featuring 39 authors, its 23 contributions are organized into seven parts: Mechanisms in Programs & Nature Systems Based on Numbers & Simple Programs Social and Biological Systems & Technology Fundamental Physics The Behavior of Systems & the Notion of Computation Irreducibility & Computational Equivalence Reflections and Philosophical Implications.

Mathematica Beyond Mathematics José Guillermo Sánchez León 2017-06-12 Although many books have been written about Mathematica, very few of them cover the new functionality added to the most recent versions of the program. Mathematica Beyond Mathematics: The Wolfram Language in the Real World introduces the new features using real-world examples, based on the experience of the author as a consultant. In the process, you will also learn more about the Wolfram Language and how you can use it to solve a wide variety of problems. The author raises questions from a wide range of topics and answers them by taking full advantage of Mathematica's latest features. For example; What sources of energy does the world really use? How can we calculate tolerance limits in manufacturing processes? Are our cities getting warmer? Is the novel El Quijote written in Pi? How can we find planets outside our solar system?

Mathematica Stephen Wolfram 1991

Mathematica Cookbook Sal Mangano 2010-04-02 Mathematica Cookbook helps you master

the application's core principles by walking you through real-world problems. Ideal for browsing, this book includes recipes for working with numerics, data structures, algebraic equations, calculus, and statistics. You'll also venture into exotic territory with recipes for data visualization using 2D and 3D graphic tools, image processing, and music. Although Mathematica 7 is a highly advanced computational platform, the recipes in this book make it accessible to everyone -- whether you're working on high school algebra, simple graphs, PhD-level computation, financial analysis, or advanced engineering models. Learn how to use Mathematica at a higher level with functional programming and pattern matching Delve into the rich library of functions for string and structured text manipulation Learn how to apply the tools to physics and engineering problems Draw on Mathematica's access to physics, chemistry, and biology data Get techniques for solving equations in computational finance Learn how to use Mathematica for sophisticated image processing Process music and audio as musical notes, analog waveforms, or digital sound samples

Combinators Stephen Wolfram 2021 "Combinators have inspired ideas about computation ever since they were first invented in 1920, and in this innovative book, Stephen Wolfram provides a modern view of combinators and their significance. Informed by his work on the computational universe of possible programs and on computational language design, Wolfram explains new and existing ideas about combinators with unique clarity and stunning visualizations, as well as provides insights on their historical connections and the curious story of Moses Schèonfinkel, inventor of combinators. Though invented well before Turing machines, combinators have often been viewed as an inaccessibly abstract approach to computation. This book brings them to life as never before in a thought-provoking and broadly accessible exposition of interest across mathematics and computer science, as well as to those concerned with the foundations of formal and computational thinking, and with the history of ideas"--

Mathematica in Action Stan Wagon 1999 "Mathematica in Action, 2nd Edition," is designed both as a guide to the extraordinary capabilities of Mathematica as well as a detailed tour of modern mathematics by one of its leading expositors, Stan Wagon. Ideal for teachers, researchers, mathematica enthusiasts. This second edition of the highly sucessful W.H. Freeman version includes an 8 page full color insert and 50% new material all organized around Elementary Topics, Intermediate Applications, and Advanced Projects. In addition, the book uses Mathematica 3.0 throughtout. Mathematica 3.0 notebooks with all the programs and examples discussed in the book are available on the TELOS web site (www.telospub.com). These notebooks contain materials suitable for DOS, Windows, Macintosh and Unix computers. Stan Wagon is well-known in the mathematics (and Mathematica) community as Associate Editor of the "American Mathematical Monthly," a columnist for the "Mathematical Intelligencer" and "Mathematica in Education and Research," author of "The Banach-Tarski Paradox" and "Unsolved Problems in Elementary Geometry and Number Theory (with Victor Klee), as well as winner of the 1987 Lester R. Ford Award for Expository Writing.

Programming with Mathematica® Paul Wellin 2013-01-10 This practical, example-driven introduction teaches the foundations of the Mathematica language so it can be applied to solving concrete problems.

An Introduction to Programming with Mathematica® Richard J. Gaylord 2012-12-06

Accompanying the book, as with all TELOS sponsored publications, is an electronic component. In this case it is a DOS-Diskette produced by one of the coauthors, Paul Wellin. This diskette consists of Mathematica notebooks and packages which contain the codes for all examples and exercises in the book, as well as additional materials intended to extend many ideas covered in the text. It is of great value to teachers, students, and others using this book to learn how to effectively program with Mathematica .

The MATHEMATICA ® Book, Version 3 Stephen Wolfram 1996-07-13 With over a million users around the world, the Mathematica ® software system created by Stephen Wolfram has defined the direction of technical computing for nearly a decade. With its major new document and computer language technology, the new version, Mathematica 3.0 takes the top-power capabilities of Mathematica and make them accessible to a vastly broader audience. This book presents this revolutionary new version of Mathematica. The Mathematica Book is a must-have purchase for anyone who wants to understand the revolutionary opportunities in science, technology, business and education made possible by Mathematica 3.0. This encompasses a broad audience of scientists and mathematicians; engineers; computer professionals; quantitative financial analysts; medical researchers; and students at high-school, college and graduate levels. Written by the creator of the system, The Mathematica Book includes both a tutorial introduction and complete reference information, and contains a comprehensive description of how to take advantage of Mathematica's ability to solve myriad technical computing problems and its powerful graphical and typesetting capabilities. Like previous editions, the book is sure to be found well-thumbed on the desks of many technical professionals and students around the world.

Dynamical Systems with Applications Using Mathematica® Stephen Lynch 2017-10-12 This book provides an introduction to the theory of dynamical systems with the aid of the Mathematica® computer algebra package. The book has a very hands-on approach and takes the reader from basic theory to recently published research material. Emphasized throughout are numerous applications to biology, chemical kinetics, economics, electronics, epidemiology, nonlinear optics, mechanics, population dynamics, and neural networks. Theorems and proofs are kept to a minimum. The first section deals with continuous systems using ordinary differential equations, while the second part is devoted to the study of discrete dynamical systems.

Computational Recreations in Mathematica Ilan Vardi 1991 Presents some common problems in mathematics and how they can be investigated using the Mathematica computer system. Problems and exercises include the calendar, sequences, the n-Queens problems, digital computing, blackjack and computing pi. This book is for those that would like to see how Mathematica is applied to real-world mathematics.

The Mathematica GuideBook for Programming Michael Trott 2013-12-21 This comprehensive, detailed reference provides readers with both a working knowledge of Mathematica in general and a detailed knowledge of the key aspects needed to create the fastest, shortest, and most elegant implementations possible. It gives users a deeper understanding of Mathematica by instructive implementations, explanations, and examples from a range of disciplines at varying levels of complexity. The three volumes -- Programming, Graphics, and Mathematics, total 3,000 pages and contain more than 15,000 Mathematica inputs, over 1,500 graphics, 4,000+ references, and more than 500 exercises.

This first volume begins with the structure of Mathematica expressions, the syntax of Mathematica, its programming, graphic, numeric and symbolic capabilities. It then covers the hierarchical construction of objects out of symbolic expressions, the definition of functions, the recognition of patterns and their efficient application, program flows and program structuring, and the manipulation of lists. An indispensible resource for students, researchers and professionals in mathematics, the sciences, and engineering.

A Physicist's Guide to Mathematica Patrick T. Tam 2011-08-09 For the engineering and scientific professional, A Physicist's Guide to Mathematica, Second Edition provides an updated reference guide based on the 2007 new 6.0 release, providing an organized and integrated desk reference with step-by-step instructions for the most commonly used features of the software as it applies to research in physics. For professors teaching physics and other science courses using the Mathematica software, A Physicist's Guide to Mathematica, Second Edition is the only fully compatible (new software release) Mathematica text that engages students by providing complete topic coverage, new applications, exercises and examples that enable the user to solve a wide range of physics problems. Does not require prior knowledge of Mathematica or computer programming Can be used as either a primary or supplemental text for upper-division physics majors Provides over 450 end-of-section exercises and end-of-chapter problems Serves as a reference suitable for chemists, physical scientists, and engineers Compatible with Mathematica Version 6, a recent major release

The Student's Introduction to MATHEMATICA ® Bruce F. Torrence 2009-01-29 The unique feature of this compact student's introduction is that it presents concepts in an order that closely follows a standard mathematics curriculum, rather than structure the book along features of the software. As a result, the book provides a brief introduction to those aspects of the Mathematica software program most useful to students. The second edition of this well loved book is completely rewritten for Mathematica 6 including coverage of the new dynamic interface elements, several hundred exercises and a new chapter on programming. This book can be used in a variety of courses, from precalculus to linear algebra. Used as a supplementary text it will aid in bridging the gap between the mathematics in the course and Mathematica. In addition to its course use, this book will serve as an excellent tutorial for those wishing to learn Mathematica and brush up on their mathematics at the same time.

Addendum to the MATHEMATICA Book Cliff Hastings 2016-11-15 For more than 25 years, Mathematica has been the principal computation environment for millions of innovators, educators, students, and others around the world. This book is an introduction to Mathematica. The goal is to provide a hands-on experience introducing the breadth of Mathematica with a focus on ease of use. Readers get detailed instruction with examples for interactive learning and end-of-chapter exercises. Each chapter also contains authors' tips from their combined 50+ years of Mathematica use.

Essentials of Programming in Mathematica® Paul Wellin 2015-12-17 This book covers Mathematica® for beginners. An example-driven text covering a wide variety of applications, containing over 350 exercises with solutions available online.

The Student's Introduction to Mathematica and the Wolfram Language Bruce F. Torrence 2019-03-31 The unique feature of this compact student's introduction to Mathematica® and the Wolfram LanguageTM is that the order of the material closely follows

a standard mathematics curriculum. As a result, it provides a brief introduction to those aspects of the Mathematica® software program most useful to students. Used as a supplementary text, it will help bridge the gap between Mathematica® and the mathematics in the course, and will serve as an excellent tutorial for former students. There have been significant changes to Mathematica® since the second edition, and all chapters have now been updated to account for new features in the software, including natural language queries and the vast stores of real-world data that are now integrated through the cloud. This third edition also includes many new exercises and a chapter on 3D printing that showcases the new computational geometry capabilities that will equip readers to print in 3D.

Multivariable Calculus with Mathematica Robert P. Gilbert 2020-11-25 Multivariable Calculus with Mathematica is a textbook addressing the calculus of several variables. Instead of just using Mathematica to directly solve problems, the students are encouraged to learn the syntax and to write their own code to solve problems. This not only encourages scientific computing skills but at the same time stresses the complete understanding of the mathematics. Questions are provided at the end of the chapters to test the student's theoretical understanding of the mathematics, and there are also computer algebra questions which test the student's ability to apply their knowledge in non-trivial ways. Features Ensures that students are not just using the package to directly solve problems, but learning the syntax to write their own code to solve problems Suitable as a main textbook for a Calculus III course, and as a supplementary text for topics scientific computing, engineering, and mathematical physics Written in a style that engages the students' interest and encourages the understanding of the mathematical ideas