

Calculus Reordered A History Of The Big Ideas

Calculus on Heisenberg Manifolds Honors Calculus Recent Developments in Several Complex Variables Discourse on Bodies in Water A Most Elegant Equation Mathematics for Machine Learning Calculus from the Ground Up The Little Book of Big Management Theories The Calculus Story Second Year Calculus Calculus Reordered Calculus Reordered An Introduction to the History of Algebra Calculus Reordered A Radical Approach to Real Analysis Proof! The Calculus Gallery The History of the Calculus and Its Conceptual Development The Origins of Infinitesimal Calculus Software Abstractions An Introduction to Analysis The Whale Magnificent Principia Qualitative Theory of Differential Equations Calculus in 3D: Geometry, Vectors, and Multivariate Calculus Book of Proof Bandit Algorithms Change Is the Only Constant The Real Analysis Lifesaver Planning Algorithms Excursions in Calculus Calculus Simplified A Radical Approach to Lebesgue's Theory of Integration Essential Calculus Skills Practice Workbook with Full Solutions The Calculus of Happiness Introduction to Representation Theory Analysis by Its History Calculus and Pizza Arithmetic Proofs and Confirmations

Calculus on Heisenberg Manifolds

How math holds the keys to improving one's health, wealth, and love life What's the best diet for overall health and weight management? How can we change our finances to retire earlier? How can we maximize our chances of finding our soul mate? In *The Calculus of Happiness*, Oscar Fernandez shows us that math yields powerful insights into health, wealth, and love. Relying on only high school-level math (precalculus with a dash of calculus), Fernandez uses everyday experiences to provide context for his mathematical insights and guides us through surprising results. Important formulas are linked to a dozen free online interactive calculators on the book's website, allowing one to personalize equations. Every chapter ends with a summary of essential lessons and takeaways, and for advanced math fans, Fernandez includes the mathematical derivations in the appendices.

Honors Calculus

Calculus is the key to much of modern science and engineering. It is the mathematical method for the analysis of things that change, and since in the natural world we are surrounded by change, the development of calculus was a huge breakthrough in the history of mathematics. But it is also something of a mathematical adventure, largely because of the way infinity enters at virtually every twist and turn In *The Calculus Story* David Acheson presents a wide-ranging picture of calculus and its applications, from ancient Greece right up to the present day. Drawing on their original writings, he introduces the people who helped to build our understanding of calculus. With a step by step treatment, he demonstrates how to start doing calculus, from the very beginning.

Recent Developments in Several Complex Variables

Meant for advanced undergraduate and graduate students in mathematics, this introduction to measure theory and Lebesgue integration is motivated by the historical questions that led to its development. The author tells the story of the mathematicians who wrestled with the difficulties inherent in the Riemann integral, leading to the work of Jordan, Borel, and Lebesgue.

Discourse on Bodies in Water

An award-winning science writer introduces us to mathematics using the extraordinary equation that unites five of mathematics' most important numbers. Bertrand Russell wrote that mathematics can exalt "as surely as poetry." This is especially true of one equation: $e^{i\pi} + 1 = 0$, the brainchild of Leonhard Euler, the Mozart of mathematics. More than two centuries after Euler's death, it is still regarded as a conceptual diamond of unsurpassed beauty. Called Euler's identity or God's equation, it includes just five numbers but represents an astonishing revelation of hidden connections. It ties together everything from basic arithmetic to compound interest, the circumference of a circle, trigonometry, calculus, and even infinity. In David Stipp's hands, Euler's identity formula becomes a contemplative stroll through the glories of mathematics. The result is an ode to this magical field.

A Most Elegant Equation

"Setting up residence in a pizza parlor, Clifford Pickover focuses on procedures for solving problems, offering short, easy-to-digest chapters that allow you to quickly get the essence of a technique or question. From exponentials and logarithms to derivatives and multiple integrals, the book utilizes pepperoni, meatballs, and more to make complex topics fun to learn - emphasizing basic, practical principles to help you calculate the speed of tossed pizza dough or the rising cost of eggplant parmigiana. Plus, you'll see how simple math - and a meal - can solve more especially curious and even mind-shattering problems."--BOOK JACKET.

Mathematics for Machine Learning

Fluent description of the development of both the integral and differential calculus — its early beginnings in antiquity, medieval contributions, and a consideration of Newton and Leibniz.

Calculus from the Ground Up

A comprehensive and rigorous introduction for graduate students and researchers, with applications in sequential decision-making problems.

The Little Book of Big Management Theories

This is an introduction to recent developments in algebraic combinatorics and an illustration of how research in mathematics actually progresses. The author recounts the story of the search for and discovery of a proof of a formula conjectured in the late 1970s: the number of $n \times n$ alternating sign matrices, objects that generalize permutation matrices. While apparent that the conjecture must be true, the proof was elusive. Researchers became drawn to this problem, making connections to aspects of invariant theory, to symmetric functions, to hypergeometric and basic hypergeometric series, and, finally, to the six-vertex model of statistical mechanics. All these threads are brought together in Zeilberger's 1996 proof of the original conjecture. The book is accessible to anyone with a knowledge of linear algebra. Students will learn what mathematicians actually do in an interesting and new area of mathematics, and even researchers in combinatorics will find something new here.

The Calculus Story

This is the first modern calculus book to be organized axiomatically and to survey the subject's applicability to science and engineering. A challenging exposition of calculus in the European

style, it is an excellent text for a first-year university honors course or for a third-year analysis course. The calculus is built carefully from the axioms with all the standard results deduced from these axioms. The concise construction, by design, provides maximal flexibility for the instructor and allows the student to see the overall flow of the development. At the same time, the book reveals the origins of the calculus in celestial mechanics and number theory. The book introduces many topics often left to the appendixes in standard calculus textbooks and develops their connections with physics, engineering, and statistics. The author uses applications of derivatives and integrals to show how calculus is applied in these disciplines. Solutions to all exercises (even those involving proofs) are available to instructors upon request, making this book unique among texts in the field. Focuses on single variable calculus Provides a balance of precision and intuition Offers both routine and demanding exercises

Second Year Calculus

An essential undergraduate textbook on algebra, topology, and calculus An Introduction to Analysis is an essential primer on basic results in algebra, topology, and calculus for undergraduate students considering advanced degrees in mathematics. Ideal for use in a one-year course, this unique textbook also introduces students to rigorous proofs and formal mathematical writing--skills they need to excel. With a range of problems throughout, An Introduction to Analysis treats n-dimensional calculus from the beginning—differentiation, the Riemann integral, series, and differential forms and Stokes's theorem—enabling students who are serious about mathematics to progress quickly to more challenging topics. The book discusses basic material on point set topology, such as normed and metric spaces, topological spaces, compact sets, and the Baire category theorem. It covers linear algebra as well, including vector spaces, linear mappings, Jordan normal form, bilinear mappings, and normal mappings. Proven in the classroom, An Introduction to Analysis is the first textbook to bring these topics together in one easy-to-use and comprehensive volume. Provides a rigorous introduction to calculus in one and several variables Introduces students to basic topology Covers topics in linear algebra, including matrices, determinants, Jordan normal form, and bilinear and normal mappings Discusses differential forms and Stokes's theorem in n dimensions Also covers the Riemann integral, integrability, improper integrals, and series expansions

Calculus Reordered

This book presents first-year calculus roughly in the order in which it was first discovered. The first two chapters show how the ancient calculations of practical problems led to infinite series, differential and integral calculus and to differential equations. The establishment of mathematical rigour for these subjects in the 19th century for one and several variables is treated in chapters III and IV. Many quotations are included to give the flavor of the history. The text is complemented by a large number of examples, calculations and mathematical pictures and will provide stimulating and enjoyable reading for students, teachers, as well as researchers.

Calculus Reordered

The description for this book, Recent Developments in Several Complex Variables. (AM-100), Volume 100, will be forthcoming.

An Introduction to the History of Algebra

Calculus from the Ground Up invites readers to become active participants in mathematics-making numbers and symbols the servants of their imaginations in ways they didn't think possible. It is a guidebook for learning not only the bare subject of calculus, but also to discover how its artistry can be applied everywhere else.

Calculus Reordered

Previously published in hardcover: 2012.

A Radical Approach to Real Analysis

The description for this book, *Calculus on Heisenberg Manifolds*. (AM-119), Volume 119, will be forthcoming.

Proof!

The author, Chris McMullen, Ph.D., has over twenty years of experience teaching math skills to physics students. He prepared this comprehensive workbook (with full solutions to every problem) to share his strategies for mastering calculus. This workbook covers a variety of essential calculus skills, including: derivatives of polynomials, trig functions, exponentials, and logarithms the chain rule, product rule, and quotient rule second derivatives how to find the extreme values of a function limits, including l'Hopital's rule antiderivatives of polynomials, trig functions, exponentials, and logarithms definite and indefinite integrals techniques of integration, including substitution, trig sub, and integration by parts multiple integrals The goal of this workbook isn't to cover every possible topic from calculus, but to focus on the most essential skills needed to apply calculus to other subjects, such as physics or engineering

The Calculus Gallery

A look at how calculus has evolved over hundreds of years and why calculus pedagogy needs to change *Calculus Reordered* tells the remarkable story of how calculus grew over centuries into the subject we know today. David Bressoud explains why calculus is credited to seventeenth-century figures Isaac Newton and Gottfried Leibniz, how it was shaped by Italian philosophers such as Galileo Galilei, and how its current structure sprang from developments in the nineteenth century. Bressoud reveals problems with the standard ordering of its curriculum—limits, differentiation, integration, and series—and he argues that a pedagogy informed by the historical evolution of calculus represents a sounder way for students to learn this fascinating area of mathematics. From calculus's birth in the Hellenistic Eastern Mediterranean, India, and the Islamic Middle East, to its contemporary iteration, *Calculus Reordered* highlights the ways this essential tool of mathematics came to be.

The History of the Calculus and Its Conceptual Development

More than three centuries after its creation, calculus remains a dazzling intellectual achievement and the gateway to higher mathematics. This book charts its growth and development by sampling from the work of some of its foremost practitioners, beginning with Isaac Newton and Gottfried Wilhelm Leibniz in the late seventeenth century and continuing to

Henri Lebesgue at the dawn of the twentieth. Now with a new preface by the author, this book documents the evolution of calculus from a powerful but logically chaotic subject into one whose foundations are thorough, rigorous, and unflinching—a story of genius triumphing over some of the toughest, subtlest problems imaginable. In touring The Calculus Gallery, we can see how it all came to be.

The Origins of Infinitesimal Calculus

Planning algorithms are impacting technical disciplines and industries around the world, including robotics, computer-aided design, manufacturing, computer graphics, aerospace applications, drug design, and protein folding. This coherent and comprehensive book unifies material from several sources, including robotics, control theory, artificial intelligence, and algorithms. The treatment is centered on robot motion planning, but integrates material on planning in discrete spaces. A major part of the book is devoted to planning under uncertainty, including decision theory, Markov decision processes, and information spaces, which are the 'configuration spaces' of all sensor-based planning problems. The last part of the book delves into planning under differential constraints that arise when automating the motions of virtually any mechanical system. This text and reference is intended for students, engineers, and researchers in robotics, artificial intelligence, and control theory as well as computer graphics, algorithms, and computational biology.

Software Abstractions

An Introduction to Analysis

Second Year Calculus: From Celestial Mechanics to Special Relativity covers multi-variable and vector calculus, emphasizing the historical physical problems which gave rise to the concepts of calculus. The book guides us from the birth of the mechanized view of the world in Isaac Newton's Mathematical Principles of Natural Philosophy in which mathematics becomes the ultimate tool for modelling physical reality, to the dawn of a radically new and often counter-intuitive age in Albert Einstein's Special Theory of Relativity in which it is the mathematical model which suggests new aspects of that reality. The development of this process is discussed from the modern viewpoint of differential forms. Using this concept, the student learns to compute orbits and rocket trajectories, model flows and force fields, and derive the laws of electricity and magnetism. These exercises and observations of mathematical symmetry enable the student to better understand the interaction of physics and mathematics.

The Whale

Very roughly speaking, representation theory studies symmetry in linear spaces. It is a beautiful mathematical subject which has many applications, ranging from number theory and combinatorics to geometry, probability theory, quantum mechanics, and quantum field theory. The goal of this book is to give a "holistic" introduction to representation theory, presenting it as a unified subject which studies representations of associative algebras and treating the representation theories of groups, Lie algebras, and quivers as special cases. Using this approach, the book covers a number of standard topics in the representation theories of these structures. Theoretical material in the book is supplemented by many problems and exercises which touch upon a lot of additional topics; the more difficult exercises are provided with hints.

The book is designed as a textbook for advanced undergraduate and beginning graduate students. It should be accessible to students with a strong background in linear algebra and a basic knowledge of abstract algebra.

Magnificent Principia

Nobel laureate Steven Weinberg has written that "all that has happened since 1687 is a gloss on the Principia." Now you too can appreciate the significance of this stellar work, regarded by many as the greatest scientific contribution of all time. Despite its dazzling reputation, Isaac Newton's *Philosophiæ Naturalis Principia Mathematica*, or simply the Principia, remains a mystery for many people. Few of even the most intellectually curious readers, including professional scientists and mathematicians, have actually looked in the Principia or appreciate its contents. Mathematician Pask seeks to remedy this deficit in this accessible guided tour through Newton's masterpiece. Using the final edition of the Principia, Pask clearly demonstrates how it sets out Newton's (and now our) approach to science; how the framework of classical mechanics is established; how terrestrial phenomena like the tides and projectile motion are explained; and how we can understand the dynamics of the solar system and the paths of comets. He also includes scene-setting chapters about Newton himself and scientific developments in his time, as well as chapters about the reception and influence of the Principia up to the present day. From the Hardcover edition.

Qualitative Theory of Differential Equations

Second edition of this introduction to real analysis, rooted in the historical issues that shaped its development.

Calculus in 3D: Geometry, Vectors, and Multivariate Calculus

Book 22 in the Princeton Mathematical Series. Originally published in 1960. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

Book of Proof

This book is an introduction to the language and standard proof methods of mathematics. It is a bridge from the computational courses (such as calculus or differential equations) that students typically encounter in their first year of college to a more abstract outlook. It lays a foundation for more theoretical courses such as topology, analysis and abstract algebra. Although it may be more meaningful to the student who has had some calculus, there is really no prerequisite other than a measure of mathematical maturity.

Bandit Algorithms

Calculus in 3D is an accessible, well-written textbook for an honors course in multivariable calculus for mathematically strong first- or second-year university students. The treatment

given here carefully balances theoretical rigor, the development of student facility in the procedures and algorithms, and inculcating intuition into underlying geometric principles. The focus throughout is on two or three dimensions. All of the standard multivariable material is thoroughly covered, including vector calculus treated through both vector fields and differential forms. There are rich collections of problems ranging from the routine through the theoretical to deep, challenging problems suitable for in-depth projects. Linear algebra is developed as needed. Unusual features include a rigorous formulation of cross products and determinants as oriented area, an in-depth treatment of conics harking back to the classical Greek ideas, and a more extensive than usual exploration and use of parametrized curves and surfaces. Zbigniew Nitecki is Professor of Mathematics at Tufts University and a leading authority on smooth dynamical systems. He is the author of *Differentiable Dynamics*, MIT Press; *Differential Equations, A First Course* (with M. Guterman), Saunders; *Differential Equations with Linear Algebra* (with M. Guterman), Saunders; and *Calculus Deconstructed*, AMS.

Change Is the Only Constant

Real analysis is difficult. For most students, in addition to learning new material about real numbers, topology, and sequences, they are also learning to read and write rigorous proofs for the first time. The *Real Analysis Lifesaver* is an innovative guide that helps students through their first real analysis course while giving them the solid foundation they need for further study in proof-based math. Rather than presenting polished proofs with no explanation of how they were devised, *The Real Analysis Lifesaver* takes a two-step approach, first showing students how to work backwards to solve the crux of the problem, then showing them how to write it up formally. It takes the time to provide plenty of examples as well as guided "fill in the blanks" exercises to solidify understanding. Newcomers to real analysis can feel like they are drowning in new symbols, concepts, and an entirely new way of thinking about math. Inspired by the popular *Calculus Lifesaver*, this book is refreshingly straightforward and full of clear explanations, pictures, and humor. It is the lifesaver that every drowning student needs. The essential "lifesaver" companion for any course in real analysis. Clear, humorous, and easy-to-read style. Teaches students not just what the proofs are, but how to do them—in more than 40 worked-out examples. Every new definition is accompanied by examples and important clarifications. Features more than 20 "fill in the blanks" exercises to help internalize proof techniques. Tried and tested in the classroom.

The Real Analysis Lifesaver

This text should not be viewed as a comprehensive history of algebra before 1600, but as a basic introduction to the types of problems that illustrate the earliest forms of algebra. It would be particularly useful for an instructor who is looking for examples to help enliven a course on elementary algebra with problems drawn from actual historical texts. --Warren Van Egmond about the French edition for MathSciNet This book does not aim to give an exhaustive survey of the history of algebra up to early modern times but merely to present some significant steps in solving equations and, wherever applicable, to link these developments to the extension of the number system. Various examples of problems, with their typical solution methods, are analyzed, and sometimes translated completely. Indeed, it is another aim of this book to ease the reader's access to modern editions of old mathematical texts, or even to the original texts; to this end, some of the problems discussed in the text have been reproduced in the appendices in their original language (Greek, Latin, Arabic, Hebrew, French, German, Provençal, and Italian) with explicative notes.

Planning Algorithms

An accessible, streamlined, and user-friendly approach to calculus. Calculus is a beautiful subject that most of us learn from professors, textbooks, or supplementary texts. Each of these resources has strengths but also weaknesses. In *Calculus Simplified*, Oscar Fernandez combines the strengths and omits the weaknesses, resulting in a “Goldilocks approach” to learning calculus: just the right level of detail, the right depth of insights, and the flexibility to customize your calculus adventure. Fernandez begins by offering an intuitive introduction to the three key ideas in calculus—limits, derivatives, and integrals. The mathematical details of each of these pillars of calculus are then covered in subsequent chapters, which are organized into mini-lessons on topics found in a college-level calculus course. Each mini-lesson focuses first on developing the intuition behind calculus and then on conceptual and computational mastery. Nearly 200 solved examples and more than 300 exercises allow for ample opportunities to practice calculus. And additional resources—including video tutorials and interactive graphs—are available on the book’s website. *Calculus Simplified* also gives you the option of personalizing your calculus journey. For example, you can learn all of calculus with zero knowledge of exponential, logarithmic, and trigonometric functions—these are discussed at the end of each mini-lesson. You can also opt for a more in-depth understanding of topics—chapter appendices provide additional insights and detail. Finally, an additional appendix explores more in-depth real-world applications of calculus. Learning calculus should be an exciting voyage, not a daunting task. *Calculus Simplified* gives you the freedom to choose your calculus experience, and the right support to help you conquer the subject with confidence.

- An accessible, intuitive introduction to first-semester calculus
- Nearly 200 solved problems and more than 300 exercises (all with answers)
- No prior knowledge of exponential, logarithmic, or trigonometric functions required
- Additional online resources—video tutorials and supplementary exercises—provided

Excursions in Calculus

The Origins of Infinitesimal Calculus focuses on the evolution, development, and applications of infinitesimal calculus. The publication first ponders on Greek mathematics, transition to Western Europe, and some center of gravity determinations in the later 16th century. Discussions focus on the growth of kinematics in the West, latitude of forms, influence of Aristotle, axiomatization of Greek mathematics, theory of proportion and means, method of exhaustion, discovery method of Archimedes, and curves, normals, tangents, and curvature. The manuscript then examines infinitesimals and indivisibles in the early 17th century and further advances in France and Italy. Topics include the link between differential and integral processes, concept of tangent, first investigations of the cycloid, and arithmetization of integration methods. The book reviews the infinitesimal methods in England and Low Countries and rectification of arcs. The publication is a vital source of information for historians, mathematicians, and researchers interested in infinitesimal calculus.

Calculus Simplified

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning

texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

A Radical Approach to Lebesgue's Theory of Integration

From his childhood fascination with the gigantic Natural History Museum model of a blue whale, to his abiding love of Moby-Dick, to his adult encounters with the living animals in the Atlantic Ocean, the acclaimed writer Philip Hoare has been obsessed with whales. *The Whale* is his unforgettable and moving attempt to explain why these strange and beautiful animals exert such a powerful hold on our imagination.

Essential Calculus Skills Practice Workbook with Full Solutions

The next book from Ben Orlin, the popular math blogger and author of the underground bestseller *Math With Bad Drawings*. *Change Is The Only Constant* is an engaging and eloquent exploration of the intersection between calculus and daily life, complete with Orlin's sly humor and wonderfully bad drawings. *Change is the Only Constant* is an engaging and eloquent exploration of the intersection between calculus and daily life, complete with Orlin's sly humor and memorably bad drawings. By spinning 28 engaging mathematical tales, Orlin shows us that calculus is simply another language to express the very things we humans grapple with every day -- love, risk, time, and most importantly, change. Divided into two parts, "Moments" and "Eternities," and drawing on everyone from Sherlock Holmes to Mark Twain to David Foster Wallace, *Change is the Only Constant* unearths connections between calculus, art, literature, and a beloved dog named Elvis. This is not just math for math's sake; it's math for the sake of becoming a wiser and more thoughtful human.

The Calculus of Happiness

How our understanding of calculus has evolved over more than three centuries, how this has shaped the way it is taught in the classroom, and why calculus pedagogy needs to change *Calculus Reordered* takes readers on a remarkable journey through hundreds of years to tell the story of how calculus evolved into the subject we know today. David Bressoud explains why calculus is credited to seventeenth-century figures Isaac Newton and Gottfried Leibniz, and how its current structure is based on developments that arose in the nineteenth century. Bressoud argues that a pedagogy informed by the historical development of calculus represents a sounder way for students to learn this fascinating area of mathematics. Delving into calculus's birth in the Hellenistic Eastern Mediterranean—particularly in Syracuse, Sicily and Alexandria, Egypt—as well as India and the Islamic Middle East, Bressoud considers how calculus developed in response to essential questions emerging from engineering and astronomy. He looks at how Newton and Leibniz built their work on a flurry of activity that occurred throughout Europe, and how Italian philosophers such as Galileo Galilei played a particularly important role. In describing calculus's evolution, Bressoud reveals problems with the standard ordering of its curriculum: limits, differentiation, integration, and series. He

contends that the historical order—integration as accumulation, then differentiation as ratios of change, series as sequences of partial sums, and finally limits as they arise from the algebra of inequalities—makes more sense in the classroom environment. Exploring the motivations behind calculus's discovery, *Calculus Reordered* highlights how this essential tool of mathematics came to be.

Introduction to Representation Theory

How our understanding of calculus has evolved over more than three centuries, how this has shaped the way it is taught in the classroom, and why calculus pedagogy needs to change. *Calculus Reordered* takes readers on a remarkable journey through hundreds of years to tell the story of how calculus evolved into the subject we know today. David Bressoud explains why calculus is credited to seventeenth-century figures Isaac Newton and Gottfried Leibniz, and how its current structure is based on developments that arose in the nineteenth century. Bressoud argues that a pedagogy informed by the historical development of calculus represents a sounder way for students to learn this fascinating area of mathematics. Delving into calculus's birth in the Hellenistic Eastern Mediterranean—particularly in Syracuse, Sicily and Alexandria, Egypt—as well as India and the Islamic Middle East, Bressoud considers how calculus developed in response to essential questions emerging from engineering and astronomy. He looks at how Newton and Leibniz built their work on a flurry of activity that occurred throughout Europe, and how Italian philosophers such as Galileo Galilei played a particularly important role. In describing calculus's evolution, Bressoud reveals problems with the standard ordering of its curriculum: limits, differentiation, integration, and series. He contends that the historical order—integration as accumulation, then differentiation as ratios of change, series as sequences of partial sums, and finally limits as they arise from the algebra of inequalities—makes more sense in the classroom environment. Exploring the motivations behind calculus's discovery, *Calculus Reordered* highlights how this essential tool of mathematics came to be.

Analysis by Its History

This book explores the rich and elegant interplay between the two main currents of mathematics, the continuous and the discrete. Such fundamental notions in discrete mathematics as induction, recursion, combinatorics, number theory, discrete probability, and the algorithmic point of view as a unifying principle are continually explored as they interact with traditional calculus.

Calculus and Pizza

An eye-opening narrative of how geometric principles fundamentally shaped our world. On a cloudy day in 1413, a balding young man stood at the entrance to the Cathedral of Florence, facing the ancient Baptistery across the piazza. As puzzled passers-by looked on, he raised a small painting to his face, then held a mirror in front of the painting. Few at the time understood what he was up to; even he barely had an inkling of what was at stake. But on that day, the master craftsman and engineer Filippo Brunelleschi would prove that the world and everything within it was governed by the ancient science of geometry. In *Proof!*, the award-winning historian Amir Alexander traces the path of the geometrical vision of the world as it coursed its way from the Renaissance to the present, shaping our societies, our politics, and our ideals. Geometry came to stand for a fixed and unchallengeable universal order, and kings, empire-

builders, and even republican revolutionaries would rush to cast their rule as the apex of the geometrical universe. For who could doubt the right of a ruler or the legitimacy of a government that drew its power from the immutable principles of Euclidean geometry? From the elegant terraces of Versailles to the broad avenues of Washington, DC and on to the boulevards of New Delhi and Manila, the geometrical vision was carved into the landscape of modernity. Euclid, Alexander shows, made the world as we know it possible.

Arithmetic

Paul Lockhart reveals arithmetic not as the rote manipulation of numbers but as a set of ideas that exhibit the surprising behaviors usually reserved for higher branches of mathematics. In this entertaining survey, he explores the nature of counting and different number systems—Western and non-Western—and weighs the pluses and minuses of each.

Proofs and Confirmations

101 management theories from the world's best management thinkers – the fast, focussed and express route to success. As a busy manager, you need solutions to everyday work problems fast. The Little Book of Big Management Theories gives you access to the very best theories and models that every manager should know and be able to use. Cutting through the waffle and hype, McGrath and Bates concentrate on the theories that really matter to managers day-to-day. Each theory is covered in two pages – telling you what it is, how to use it and the questions you should be asking – so you can immediately apply your new knowledge in the real world. The Little Book of Big Management Theories will ensure you can: Quickly resolve a wide range of practical management problems Be a better, more decisive manager who gets the job done Better motivate and influence your staff, colleagues and stakeholders Improve your standing and demonstrate that you are ready for promotion All you need to know and how to apply it – in a nutshell.

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