History Of Mathematics Victor Katz 3rd Edition

Math through the Ages: A Gentle History for Teachers and Others Expanded Second EditionJourney through MathematicsA Treatise of AlgebraAn Episodic History of MathematicsThe Mathematics of Egypt, Mesopotamia, China, India, and IslamMathematics in Historical ContextHistory of TopologyNumbers RuleHistorical Encyclopedia of Natural and Mathematical SciencesMathematics in IndiaSourcebook in the Mathematics of Medieval Europe and North AfricaMathematics in Ancient IraqThe History of MathematicsWho Gave You the Epsilon?KatzRecent Developments on Introducing a Historical Dimension in Mathematics EducationTaming the UnknownA Remarkable Collection of Babylonian Mathematical TextsCombinatorics: Ancient & ModernMathematics and Its HistoryA History of Mathematics (Classic Version)Mathematics in Ancient EgyptHistory in Mathematics EducationA History of AlgebraHow to Read Historical MathematicsThe History of Mathematics: A Very Short IntroductionA History of MathematicsThe History of MathematicsA History of MathematicsUnknown QuantityHands on HistorySherlock Holmes in BabylonThe Princeton Companion to MathematicsUsing History to Teach MathematicsThe History of Mathematics: An IntroductionAn Imaginary TaleLearn from the MastersThe History of MathematicsLeonhard EulerHistorical Modules for the Teaching and Learning of Mathematics

Math through the Ages: A Gentle History for Teachers and Others Expanded Second Edition

Mathematics is a fundamental human activity that can be practised and understood in a multitude of ways; indeed, mathematical ideas themselves are far from being fixed, but are adapted and changed by their passage across periods and cultures. In this Very Short Introduction, Jacqueline Stedall explores the rich historical and cultural diversity of mathematical endeavour from the distant past to the present day. Arranged thematically, to exemplify the varied contexts in which people have learned, used, and handed on mathematics, she also includes illustrative case studies drawn from a range of times and places, including early imperial China, the medieval Islamic world, and nineteenth-century Britain. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Journey through Mathematics

This new edition brings the fascinating and intriguing historyof mathematics to life The Second Edition of this internationally acclaimed text hasbeen thoroughly revised, updated, and reorganized to give readers afresh perspective on the evolution of

mathematics. Written by oneof the world's leading experts on the history of mathematics, thebook details the key historical developments in the field,providing an understanding and appreciation of how mathematicsinfluences today's science, art, music, literature, andsociety. In the first edition, each chapter was devoted to a singleculture. This Second Edition is organized by subject matter: ageneral survey of mathematics in many cultures, arithmetic,geometry, algebra, analysis, and mathematical inference. This neworganization enables students to focus on one complete topic and,at the same time, compare how different cultures approached eachtopic. Many new photographs and diagrams have been added to thisedition to enhance the presentation. The text is divided into seven parts: The World of Mathematics and the Mathematics of the World,including the origin and prehistory of mathematics, culturalsurveys, and women mathematicians Numbers, including counting, calculation, ancient numbertheory, and numbers and number theory in modern mathematics Color Plates, illustrating the impact of mathematics oncivilizations from Egypt to Japan to Mexico to modern Europe Space, including measurement, Euclidean geometry,post-Euclidean geometry, and modern geometrics Algebra, including problems leading to algebra, equations andmethods, and modern algebra Analysis, including the calculus, real, and complexanalysis Mathematical Inference, including probability and statistics,and logic and set theory As readers progress through the text, they learn about theevolution of each topic, how different cultures devised their ownsolutions, and how these solutions

enabled the cultures to developand progress. In addition, readers will meet some of the greatestmathematicians of the ages, who helped lay the groundwork fortoday's science and technology. The book's lively approach makes it appropriate for anyoneinterested in learning how the field of mathematics came to be whatit is today. It can also serve as a textbook for undergraduate orgraduate-level courses. An Instructor's Manual presenting detailedsolutions to all the problems in the book is available upon requestfrom the Wiley editorial department.

A Treatise of Algebra

An exploration of the interaction between mathematics, mathematicians and society. What would Newton see if he looked out his window?

An Episodic History of Mathematics

Today complex numbers have such widespread practical use--from electrical engineering to aeronautics--that few people would expect the story behind their derivation to be filled with adventure and enigma. In An Imaginary Tale, Paul Nahin tells the 2000-year-old history of one of mathematics' most elusive numbers, the square root of minus one, also known as i. He recreates the baffling mathematical problems that conjured it up, and the colorful characters who tried to solve them. In 1878, when two brothers stole a mathematical papyrus from the ancient Egyptian burial site in the Valley of Kings,

they led scholars to the earliest known occurrence of the square root of a negative number. The papyrus offered a specific numerical example of how to calculate the volume of a truncated square pyramid, which implied the need for i. In the first century, the mathematician-engineer Heron of Alexandria encountered I in a separate project, but fudged the arithmetic; medieval mathematicians stumbled upon the concept while grappling with the meaning of negative numbers, but dismissed their square roots as nonsense. By the time of Descartes, a theoretical use for these elusive square roots--now called "imaginary numbers"--was suspected, but efforts to solve them led to intense, bitter debates. The notorious i finally won acceptance and was put to use in complex analysis and theoretical physics in Napoleonic times. Addressing readers with both a general and scholarly interest in mathematics, Nahin weaves into this narrative entertaining historical facts and mathematical discussions, including the application of complex numbers and functions to important problems, such as Kepler's laws of planetary motion and ac electrical circuits. This book can be read as an engaging history, almost a biography, of one of the most evasive and pervasive "numbers" in all of mathematics. Some images inside the book are unavailable due to digital copyright restrictions.

The Mathematics of Egypt, Mesopotamia, China, India, and Islam

An Episodic History of Mathematics will acquaint

students and readers with mathematical language, thought, and mathematical life by means of historically important mathematical vignettes. It will also serve to help prospective teachers become more familiar with important ideas of in the history of mathematicsboth classical and modern.Contained within are wonderful and engaging stories and anecdotes about Pythagoras and Galois and Cantor and Poincar, which let readers indulge themselves in whimsy, gossip, and learning. The mathematicians treated here were complex individuals who led colorful and fascinating lives, and did fascinating mathematics. They remain interesting to us as people and as scientists.This history of mathematics is also an opportunity to have some fun because the focus in this text is also on the practicalgetting involved with the mathematics and solving problems. This book is unabashedly mathematical. In the course of reading this book, the neophyte will become involved with mathematics by working on the same problems that, for instance, Zeno and Pythagoras and Descartes and Fermat and Riemann worked on.This is a book to be read, therefore, with pencil and paper in hand, and a calculator or computer close by. All will want to experiment; to try things; and become a part of the mathematical process.

Mathematics in Historical Context

History of Topology

This textbook provides a unified and concise

exploration of undergraduate mathematics by approaching the subject through its history. Readers will discover the rich tapestry of ideas behind familiar topics from the undergraduate curriculum, such as calculus, algebra, topology, and more. Featuring historical episodes ranging from the Ancient Greeks to Fermat and Descartes, this volume offers a glimpse into the broader context in which these ideas developed, revealing unexpected connections that make this ideal for a senior capstone course. The presentation of previous versions has been refined by omitting the less mainstream topics and inserting new connecting material, allowing instructors to cover the book in a one-semester course. This condensed edition prioritizes succinctness and cohesiveness, and there is a greater emphasis on visual clarity, featuring full color images and high quality 3D models. As in previous editions, a wide array of mathematical topics are covered, from geometry to computation; however, biographical sketches have been omitted.
Mathematics and Its History: A Concise Edition is an essential resource for courses or reading programs on the history of mathematics. Knowledge of basic calculus, algebra, geometry, topology, and set theory is assumed. From reviews of previous editions: “Mathematics and Its History is a joy to read. The writing is clear, concise and inviting. The style is very different from a traditional text. I found myself picking it up to read at the expense of my usual late evening thriller or detective novel. The author has done a wonderful job of tying together the dominant themes of undergraduate mathematics.” Richard J. Wilders, MAA, on the Third Edition "The bookis presented in a lively style without unnecessary detail. It is very

stimulating and will be appreciated not only by students. Much attention is paid to problems and to the development of mathematics before the end of the nineteenth century. This book brings to the non-specialist interested in mathematics many interesting results. It can be recommended for seminars and will be enjoyed by the broad mathematical community." European Mathematical Society, on the Second Edition

Numbers Rule

This is a one-of-a-kind reference for anyone with a serious interest in mathematics. Edited by Timothy Gowers, a recipient of the Fields Medal, it presents nearly two hundred entries, written especially for this book by some of the world's leading mathematicians, that introduce basic mathematical tools and vocabulary; trace the development of modern mathematics; explain essential terms and concepts; examine core ideas in major areas of mathematics; describe the achievements of scores of famous mathematicians; explore the impact of mathematics on other disciplines such as biology, finance, and music--and much, much more. Unparalleled in its depth of coverage, The Princeton Companion to Mathematics surveys the most active and exciting branches of pure mathematics. Accessible in style, this is an indispensable resource for undergraduate and graduate students in mathematics as well as for researchers and scholars seeking to understand areas outside their specialties. Features nearly 200 entries, organized thematically and written by an international

team of distinguished contributors Presents major ideas and branches of pure mathematics in a clear, accessible style Defines and explains important mathematical concepts, methods, theorems, and open problems Introduces the language of mathematics and the goals of mathematical research Covers number theory, algebra, analysis, geometry, logic, probability, and more Traces the history and development of modern mathematics Profiles more than ninety-five mathematicians who influenced those working today Explores the influence of mathematics on other disciplines Includes bibliographies, cross-references, and a comprehensive index Contributors incude: Graham Allan, Noga Alon, George Andrews, Tom Archibald, Sir Michael Atiyah, David Aubin, Joan Bagaria, Keith Ball, June Barrow-Green, Alan Beardon, David D. Ben-Zvi, Vitaly Bergelson, Nicholas Bingham, Béla Bollobás, Henk Bos, Bodil Branner, Martin R. Bridson, John P. Burgess, Kevin Buzzard, Peter J. Cameron, Jean-Luc Chabert, Eugenia Cheng, Clifford C. Cocks, Alain Connes, Leo Corry, Wolfgang Coy, Tony Crilly, Serafina Cuomo, Mihalis Dafermos, Partha Dasgupta, Ingrid Daubechies, Joseph W. Dauben, John W. Dawson Jr., Francois de Gandt, Persi Diaconis, Jordan S. Ellenberg, Lawrence C. Evans, Florence Fasanelli, Anita Burdman Feferman, Solomon Feferman, Charles Fefferman, Della Fenster, José Ferreirós, David Fisher, Terry Gannon, A. Gardiner, Charles C. Gillispie, Oded Goldreich, Catherine Goldstein, Fernando Q. Gouvêa, Timothy Gowers, Andrew Granville, Ivor Grattan-Guinness, Jeremy Gray, Ben Green, Ian Grojnowski, Niccolò Guicciardini, Michael Harris, Ulf Hashagen, Nigel Higson, Andrew Hodges, F. E. A. Johnson, Mark Joshi, Kiran S. Kedlaya,

Frank Kelly, Sergiu Klainerman, Jon Kleinberg, Israel Kleiner, Jacek Klinowski, Eberhard Knobloch, János Kollár, T. W. Körner, Michael Krivelevich, Peter D. Lax, Imre Leader, Jean-François Le Gall, W. B. R. Lickorish, Martin W. Liebeck, Jesper Lützen, Des MacHale, Alan L. Mackay, Shahn Majid, Lech Maligranda, David Marker, Jean Mawhin, Barry Mazur, Dusa McDuff, Colin McLarty, Bojan Mohar, Peter M. Neumann, Catherine Nolan, James Norris, Brian Osserman, Richard S. Palais, Marco Panza, Karen Hunger Parshall, Gabriel P. Paternain, Jeanne Peiffer, Carl Pomerance, Helmut Pulte, Bruce Reed, Michael C. Reed, Adrian Rice, Eleanor Robson, Igor Rodnianski, John Roe, Mark Ronan, Edward Sandifer, Tilman Sauer, Norbert Schappacher, Andrzej Schinzel, Erhard Scholz, Reinhard Siegmund-Schultze, Gordon Slade, David J. Spiegelhalter, Jacqueline Stedall, Arild Stubhaug, Madhu Sudan, Terence Tao, Jamie Tappenden, C. H. Taubes, Rüdiger Thiele, Burt Totaro, Lloyd N. Trefethen, Dirk van Dalen, Richard Weber, Dominic Welsh, Avi Wigderson, Herbert Wilf, David Wilkins, B. Yandell, Eric Zaslow, Doron Zeilberger

Historical Encyclopedia of Natural and Mathematical Sciences

Research shows that students learn best when they actively participate in their learning. In particular, hands-on activities provide the greatest opportunities for gaining understanding and promoting retention. Apart from simple manipulatives, the mathematics classroom offers few options for hands-on activities. However, the history of mathematics offers many

ways to incorporate hands-on learning. By bringing this material culture of mathematics into the classroom, students can experience historical applications and uses of mathematics in a setting rich in discovery and intellectual interest. This volume is a compilation of articles from researchers and educators who use the history of mathematics to facilitate active learning in the classroom. The contributions range from simple devices, such as the rectangular protractor, to elaborate models of descriptive geometry. Other chapters provide detailed descriptions on how to build and use historical models in the high school or collegiate classroom.

Mathematics in India

Techniques for deciphering texts by early mathematicians Writings by early mathematicians feature language and notations that are quite different from what we're familiar with today. Sourcebooks on the history of mathematics provide some guidance, but what has been lacking is a guide tailored to the needs of readers approaching these writings for the first time. How to Read Historical Mathematics fills this gap by introducing readers to the analytical questions historians ask when deciphering historical texts. Sampling actual writings from the history of mathematics, Benjamin Wardhaugh reveals the questions that will unlock the meaning and significance of a given text—Who wrote it, why, and for whom? What was its author's intended meaning? How did it reach its present form? Is it original or a translation? Why is it important today?

Wardhaugh teaches readers to think about what the original text might have looked like, to consider where and when it was written, and to formulate questions of their own. Readers pick up new skills with each chapter, and gain the confidence and analytical sophistication needed to tackle virtually any text in the history of mathematics. Introduces readers to the methods of textual analysis used by historians Uses actual source material as examples Features boxed summaries, discussion questions, and suggestions for further reading Supplements all major sourcebooks in mathematics history Designed for easy reference Ideal for students and teachers

Sourcebook in the Mathematics of Medieval Europe and North Africa

Mathematics in Ancient Iraq

Prime Obsession taught us not to be afraid to put the math in a math book. Unknown Quantity heeds the lesson well. So grab your graphing calculators, slip out the slide rules, and buckle up! John Derbyshire is introducing us to algebra through the ages-and it promises to be just what his die-hard fans have been waiting for. "Here is the story of algebra." With this deceptively simple introduction, we begin our journey. Flanked by formulae, shadowed by roots and radicals, escorted by an expert who navigates unerringly on our behalf, we are guaranteed safe passage through even the most treacherous mathematical terrain. Our first encounter with algebraic arithmetic takes us

back 38 centuries to the time of Abraham and Isaac, Jacob and Joseph, Ur and Haran, Sodom and Gomorrah. Moving deftly from Abel's proof to the higher levels of abstraction developed by Galois, we are eventually introduced to what algebraists have been focusing on during the last century. As we travel through the ages, it becomes apparent that the invention of algebra was more than the start of a specific discipline of mathematics-it was also the birth of a new way of thinking that clarified both basic numeric concepts as well as our perception of the world around us. Algebraists broke new ground when they discarded the simple search for solutions to equations and concentrated instead on abstract groups. This dramatic shift in thinking revolutionized mathematics. Written for those among us who are unencumbered by a fear of formulae, Unknown Quantity delivers on its promise to present a history of algebra. Astonishing in its bold presentation of the math and graced with narrative authority, our journey through the world of algebra is at once intellectually satisfying and pleasantly challenging.

The History of Mathematics

The year 2007 marks the 300th anniversary of the birth of one of the Enlightenment’s most important mathematicians and scientists, Leonhard Euler. This volume is a collection of 24 essays by some of the world’s best Eulerian scholars from seven different countries about Euler, his life and his work. Some of the essays are historical, including much previously unknown information about Euler’s life, his activities

in the St. Petersburg Academy, the influence of the Russian Princess Dashkova, and Euler's philosophy. Others describe his influence on the subsequent growth of European mathematics and physics in the 19th century. Still others give technical details of Euler's innovations in probability, number theory, geometry, analysis, astronomy, mechanics and other fields of mathematics and science. - Over 20 essays by some of the best historians of mathematics and science, including Ronald Calinger, Peter Hoffmann, Curtis Wilson, Kim Plofker, Victor Katz, Ruediger Thiele, David Richeson, Robin Wilson, Ivor Grattan-Guinness and Karin Reich - New details of Euler's life in two essays, one by Ronald Calinger and one he co-authored with Elena Polyakhova - New information on Euler's work in differential geometry, series, mechanics, and other important topics including his influence in the early 19th century

Who Gave You the Epsilon?

Katz

Recent Developments on Introducing a Historical Dimension in Mathematics Education

This text is designed for the junior/senior mathematics major who intends to teach mathematics in high school or college. It concentrates on the history of those topics typically covered in an

undergraduate curriculum or in elementary schools or high schools. At least one year of calculus is a prerequisite for this course. This book contains enough material for a 2 semester course but it is flexible enough to be used in the more common 1 semester course.

Taming the Unknown

This book offers an accessible and in-depth look at some of the most important episodes of two thousand years of mathematical history. Beginning with trigonometry and moving on through logarithms, complex numbers, infinite series, and calculus, this book profiles some of the lesser known but crucial contributors to modern day mathematics. It is unique in its use of primary sources as well as its accessibility; a knowledge of first-year calculus is the only prerequisite. But undergraduate and graduate students alike will appreciate this glimpse into the fascinating process of mathematical creation. The history of math is an intercontinental journey, and this book showcases brilliant mathematicians from Greece, Egypt, and India, as well as Europe and the Islamic world. Several of the primary sources have never before been translated into English. Their interpretation is thorough and readable, and offers an excellent background for teachers of high school mathematics as well as anyone interested in the history of math.

A Remarkable Collection of Babylonian Mathematical Texts

Combinatorics: Ancient & Modern

This monumental book traces the origins and development of mathematics in the ancient Middle East, from its earliest beginnings in the fourth millennium BCE to the end of indigenous intellectual culture in the second century BCE when cuneiform writing was gradually abandoned. Eleanor Robson offers a history like no other, examining ancient mathematics within its broader social, political, economic, and religious contexts, and showing that mathematics was not just an abstract discipline for elites but a key component in ordering society and understanding the world. The region of modern-day Iraq is uniquely rich in evidence for ancient mathematics because its prehistoric inhabitants wrote on clay tablets, many hundreds of thousands of which have been archaeologically excavated, deciphered, and translated. Drawing from these and a wealth of other textual and archaeological evidence, Robson gives an extraordinarily detailed picture of how mathematical ideas and practices were conceived, used, and taught during this period. She challenges the prevailing view that they were merely the simplistic precursors of classical Greek mathematics, and explains how the prevailing view came to be. Robson reveals the true sophistication and beauty of ancient Middle Eastern mathematics as it evolved over three thousand years, from the earliest beginnings of recorded accounting to complex mathematical astronomy. Every chapter provides detailed information on sources, and the book

includes an appendix on all mathematical cuneiform tablets published before 2007.

Mathematics and Its History

This ground-breaking book investigates how the learning and teaching of mathematics can be improved through integrating the history of mathematics into all aspects of mathematics education: lessons, homework, texts, lectures, projects, assessment, and curricula. It draws upon evidence from the experience of teachers as well as national curricula, textbooks, teacher education practices, and research perspectives across the world. It includes a 300-item annotated bibliography of recent work in the field in eight languages.

A History of Mathematics (Classic Version)

The book analyzes the mathematical tablets from the private collection of Martin Schoyen. It includes analyses of tablets which have never been studied before. This provides new insight into Babylonian understanding of sophisticated mathematical objects. The book is carefully written and organized. The tablets are classified according to mathematical content and purpose, while drawings and pictures are provided for the most interesting tablets.

Mathematics in Ancient Egypt

History in Mathematics Education

A History of Mathematics, Third Edition, provides students with a solid background in the history of mathematics and focuses on the most important topics for today's elementary, high school, and college curricula. Students will gain a deeper understanding of mathematical concepts in their historical context, and future teachers will find this book a valuable resource in developing lesson plans based on the history of each topic. This book is ideal for a junior or senior level course in the history of mathematics for mathematics majors intending to become teachers.

A History of Algebra

What is algebra? For some, it is an abstract language of x's and y's. For mathematics majors and professional mathematicians, it is a world of axiomatically defined constructs like groups, rings, and fields. Taming the Unknown considers how these two seemingly different types of algebra evolved and how they relate. Victor Katz and Karen Parshall explore the history of algebra, from its roots in the ancient civilizations of Egypt, Mesopotamia, Greece, China, and India, through its development in the medieval Islamic world and medieval and early modern Europe, to its modern form in the early twentieth century. Defining algebra originally as a collection of techniques for determining unknowns, the authors trace the development of these techniques from geometric beginnings in ancient

Egypt and Mesopotamia and classical Greece. They show how similar problems were tackled in Alexandrian Greece, in China, and in India, then look at how medieval Islamic scholars shifted to an algorithmic stage, which was further developed by medieval and early modern European mathematicians. With the introduction of a flexible and operative symbolism in the sixteenth and seventeenth centuries, algebra entered into a dynamic period characterized by the analytic geometry that could evaluate curves represented by equations in two variables, thereby solving problems in the physics of motion. This new symbolism freed mathematicians to study equations of degrees higher than two and three, ultimately leading to the present abstract era. Taming the Unknown follows algebra's remarkable growth through different epochs around the globe.

How to Read Historical Mathematics

Collection of essays on the history of mathematics by distinguished authorities.

The History of Mathematics: A Very Short Introduction

Topology, for many years, has been one of the most exciting and influential fields of research in modern mathematics. Although its origins may be traced back several hundred years, it was Poincaré who "gave topology wings" in a classic series of articles published around the turn of the century. While the

earlier history, sometimes called the prehistory, is also considered, this volume is mainly concerned with the more recent history of topology, from Poincaré onwards. As will be seen from the list of contents the articles cover a wide range of topics. Some are more technical than others, but the reader without a great deal of technical knowledge should still find most of the articles accessible. Some are written by professional historians of mathematics, others by historically-minded mathematicians, who tend to have a different viewpoint.

A History of Mathematics

Who first presented Pascal's triangle? (It was not Pascal.) Who first presented Hamiltonian graphs? (It was not Hamilton.) Who first presented Steiner triple systems? (It was not Steiner.) The history of mathematics is a well-studied and vibrant area of research, with books and scholarly articles published on various aspects of the subject. Yet, the history of combinatorics seems to have been largely overlooked. This book goes some way to redress this and serves two main purposes: 1) it constitutes the first book-length survey of the history of combinatorics; and 2) it assembles, for the first time in a single source, researches on the history of combinatorics that would otherwise be inaccessible to the general reader. Individual chapters have been contributed by sixteen experts. The book opens with an introduction by Donald E. Knuth to two thousand years of combinatorics. This is followed by seven chapters on early combinatorics, leading from Indian

and Chinese writings on permutations to late-Renaissance publications on the arithmetical triangle. The next seven chapters trace the subsequent story, from Euler's contributions to such wide-ranging topics as partitions, polyhedra, and latin squares to the 20th century advances in combinatorial set theory, enumeration, and graph theory. The book concludes with some combinatorial reflections by the distinguished combinatorialist, Peter J. Cameron. This book is not expected to be read from cover to cover, although it can be. Rather, it aims to serve as a valuable resource to a variety of audiences. Combinatorialists with little or no knowledge about the development of their subject will find the historical treatment stimulating. A historian of mathematics will view its assorted surveys as an encouragement for further research in combinatorics. The more general reader will discover an introduction to a fascinating and too little known subject that continues to stimulate and inspire the work of scholars today.

The History of Mathematics

A History of Mathematics: From Mesopotamia to Modernity covers the evolution of mathematics through time and across the major Eastern and Western civilizations. It begins in Babylon, then describes the trials and tribulations of the Greek mathematicians. The important, and often neglected, influence of both Chinese and Islamic mathematics is covered in detail, placing the description of early Western mathematics in a global context. The book

concludes with modern mathematics, covering recent developments such as the advent of the computer, chaos theory, topology, mathematical physics, and the solution of Fermat's Last Theorem. Containing more than 100 illustrations and figures, this text, aimed at advanced undergraduates and postgraduates, addresses the methods and challenges associated with studying the history of mathematics. The reader is introduced to the leading figures in the history of mathematics (including Archimedes, Ptolemy, Qin Jiushao, al-Kashi, al-Khwarizmi, Galileo, Newton, Leibniz, Helmholtz, Hilbert, Alan Turing, and Andrew Wiles) and their fields. An extensive bibliography with cross-references to key texts will provide invaluable resource to students and exercises (with solutions) will stretch the more advanced reader.

A History of Mathematics

One of the leading historians in the mathematics field, Victor Katz provides a world view of mathematics, balancing ancient, early modern, and modern history.

Unknown Quantity

This volume examines how the history of mathematics can find application in the teaching of mathematics itself.

Hands on History

This book picks up the history of mathematics from

where Sherlock Holmes in Babylon left it. The 40 articles of Who Gave You the Epsilon? continue the story of the development of mathematics into the nineteenth and twentieth centuries. The articles have all been published in the Mathematical Association of America journals and are in many cases written by distinguished mathematicians such as G. H. Hardy and B. van der Waerden. The articles are arranged thematically to show the development of analysis, geometry, algebra and number theory through this period of time. Each chapter is preceded by a foreword, giving the historical background and setting and the scene, and is followed by an afterword, reporting on advances in our historical knowledge and understanding since the articles first appeared. This book is ideal for anyone wanting to explore the history of mathematics.

Sherlock Holmes in Babylon

Since the very birth of democracy in ancient Greece, the simple act of voting has given rise to mathematical paradoxes that have puzzled some of the greatest philosophers, statesmen, and mathematicians. Numbers Rule traces the epic quest by these thinkers to create a more perfect democracy and adapt to the ever-changing demands that each new generation places on our democratic institutions. In a sweeping narrative that combines history, biography, and mathematics, George Szpiro details the fascinating lives and big ideas of great minds such as Plato, Pliny the Younger, Ramon Llull, Pierre Simon Laplace, Thomas Jefferson, Alexander Hamilton, John

von Neumann, and Kenneth Arrow, among many others. Each chapter in this riveting book tells the story of one or more of these visionaries and the problem they sought to overcome, like the Marquis de Condorcet, the eighteenth-century French nobleman who demonstrated that a majority vote in an election might not necessarily result in a clear winner. Szpiro takes readers from ancient Greece and Rome to medieval Europe, from the founding of the American republic and the French Revolution to today's high-stakes elective politics. He explains how mathematical paradoxes and enigmas can crop up in virtually any voting arena, from electing a class president, a pope, or prime minister to the apportionment of seats in Congress. Numbers Rule describes the trials and triumphs of the thinkers down through the ages who have dared the odds in pursuit of a just and equitable democracy.

The Princeton Companion to Mathematics

In recent decades it has become obvious that mathematics has always been a worldwide activity. But this is the first book to provide a substantial collection of English translations of key mathematical texts from the five most important ancient and medieval non-Western mathematical cultures, and to put them into full historical and mathematical context. The Mathematics of Egypt, Mesopotamia, China, India, and Islam gives English readers a firsthand understanding and appreciation of these cultures' important contributions to world

mathematics. The five section authors--Annette Imhausen (Egypt), Eleanor Robson (Mesopotamia), Joseph Dauben (China), Kim Plofker (India), and J. Lennart Berggren (Islam)--are experts in their fields. Each author has selected key texts and in many cases provided new translations. The authors have also written substantial section introductions that give an overview of each mathematical culture and explanatory notes that put each selection into context. This authoritative commentary allows readers to understand the sometimes unfamiliar mathematics of these civilizations and the purpose and significance of each text. Addressing a critical gap in the mathematics literature in English, this book is an essential resource for anyone with at least an undergraduate degree in mathematics who wants to learn about non-Western mathematical developments and how they helped shape and enrich world mathematics. The book is also an indispensable guide for mathematics teachers who want to use non-Western mathematical ideas in the classroom.

Using History to Teach Mathematics

Originally published in 2009, reissued as part of Pearson's modern classic series.

The History of Mathematics: An Introduction

`Math through the Ages' is a treasure, one of the best history of math books at its level ever written. Somehow, it manages to stay true to a surprisingly

sophisticated story, while respecting the needs of its audience. Its overview of the subject captures most of what one needs to know, and the 30 sketches are small gems of exposition that stimulate further exploration. --Glen van Brummelen, Quest University, President (2012-14) of the Canadian Society for History and Philosophy of Mathematics Where did math come from? Who thought up all those algebra symbols, and why? What is the story behind pi? negative numbers? the metric system? quadratic equations? sine and cosine? logs? The 30 independent historical sketches in Math through the Ages answer these questions and many others in an informal, easygoing style that is accessible to teachers, students, and anyone who is curious about the history of mathematical ideas. Each sketch includes Questions and Projects to help you learn more about its topic and to see how the main ideas fit into the bigger picture of history. The 30 short stories are preceded by a 58-page bird's-eye overview of the entire panorama of mathematical history, a whirlwind tour of the most important people, events, and trends that shaped the mathematics we know today. ``What to Read Next'' and reading suggestions after each sketch provide starting points for readers who want to learn more. This book is ideal for a broad spectrum of audiences, including students in history of mathematics courses at the late high school or early college level, pre-service and in-service teachers, and anyone who just wants to know a little more about the origins of mathematics.

An Imaginary Tale

A survey of ancient Egyptian mathematics across three thousand years Mathematics in Ancient Egypt traces the development of Egyptian mathematics, from the end of the fourth millennium BC—and the earliest hints of writing and number notation—to the end of the pharaonic period in Greco-Roman times. Drawing from mathematical texts, architectural drawings, administrative documents, and other sources, Annette Imhausen surveys three thousand years of Egyptian history to present an integrated picture of theoretical mathematics in relation to the daily practices of Egyptian life and social structures. Imhausen shows that from the earliest beginnings, pharaonic civilization used numerical techniques to efficiently control and use their material resources and labor. Even during the Old Kingdom, a variety of metrological systems had already been devised. By the Middle Kingdom, procedures had been established to teach mathematical techniques to scribes in order to make them proficient administrators for their king. Imhausen looks at counterparts to the notation of zero, suggests an explanation for the evolution of unit fractions, and analyzes concepts of arithmetic techniques. She draws connections and comparisons to Mesopotamian mathematics, examines which individuals in Egyptian society held mathematical knowledge, and considers which scribes were trained in mathematical ideas and why. Of interest to historians of mathematics, mathematicians, Egyptologists, and all those curious about Egyptian culture, Mathematics in Ancient Egypt sheds new light on a civilization's unique mathematical evolution.

Learn from the Masters

Based on extensive research in Sanskrit sources, Mathematics in India chronicles the development of mathematical techniques and texts in South Asia from antiquity to the early modern period. Kim Plofker reexamines the few facts about Indian mathematics that have become common knowledge--such as the Indian origin of Arabic numerals--and she sets them in a larger textual and cultural framework. The book details aspects of the subject that have been largely passed over in the past, including the relationships between Indian mathematics and astronomy, and their cross-fertilizations with Islamic scientific traditions. Plofker shows that Indian mathematics appears not as a disconnected set of discoveries, but as a lively, diverse, yet strongly unified discipline, intimately linked to other Indian forms of learning. Far more than in other areas of the history of mathematics, the literature on Indian mathematics reveals huge discrepancies between what researchers generally agree on and what general readers pick up from popular ideas. This book explains with candor the chief controversies causing these discrepancies--both the flaws in many popular claims, and the uncertainties underlying many scholarly conclusions. Supplementing the main narrative are biographical resources for dozens of Indian mathematicians; a guide to key features of Sanskrit for the non-Indologist; and illustrations of manuscripts, inscriptions, and artifacts. Mathematics in India provides a rich and complex understanding of the Indian mathematical tradition. **Author's note:

The concept of "computational positivism" in Indian mathematical science, mentioned on p. 120, is due to Prof. Roddam Narasimha and is explored in more detail in some of his works, including "The Indian half of Needham's question: some thoughts on axioms, models, algorithms, and computational positivism" (Interdisciplinary Science Reviews 28, 2003, 1-13).

The History of Mathematics

Medieval Europe was a meeting place for the Christian, Jewish, and Islamic civilizations, and the fertile intellectual exchange of these cultures can be seen in the mathematical developments of the time. This sourcebook presents original Latin, Hebrew, and Arabic sources of medieval mathematics, and shows their cross-cultural influences. Most of the Hebrew and Arabic sources appear here in translation for the first time. Readers will discover key mathematical revelations, foundational texts, and sophisticated writings by Latin, Hebrew, and Arabic-speaking mathematicians, including Abner of Burgos's elegant arguments proving results on the conchoid—a curve previously unknown in medieval Europe; Levi ben Gershon’s use of mathematical induction in combinatorial proofs; Al-Mu’taman Ibn Hūd’s extensive survey of mathematics, which included proofs of Heron’s Theorem and Ceva’s Theorem; and Muhyī al-Dīn al-Maghribī’s interesting proof of Euclid’s parallel postulate. The book includes a general introduction, section introductions, footnotes, and references. The Sourcebook in the Mathematics of Medieval Europe and North Africa will be

indispensable to anyone seeking out the important historical sources of premodern mathematics.

Leonhard Euler

This book is for high school and college teachers who want to know how they can use the history of mathematics as a pedagogical tool to help their students construct their own knowledge of mathematics. Often, a historical development of a particular topic is the best way to present a mathematical topic, but teachers may not have the time to do the research needed to present the material. This book provides its readers with historical ideas and insights which can be immediately applied in the classroom. The book is divided into two sections: the first on the use of history in high school mathematics, and the second on its use in university mathematics. The articles are diverse, covering fields such as trigonometry, mathematical modeling, calculus, linear algebra, vector analysis, and celestial mechanics. Also included are articles of a somewhat philosophical nature, which give general ideas on why history should be used in teaching and how it can be used in various special kinds of courses. Each article contains a bibliography to guide the reader to further reading on the subject.

Historical Modules for the Teaching and Learning of Mathematics

One of the leading historians in the mathematics field, Victor Katz provides a world view of mathematics,

balancing ancient, early modern, and modern history. Egypt and Mesopotamia, Greek Mathematics to the Time of Euclid, Greek Mathematics from Archimedes to Ptolemy, Diophantus to Hypatia, Ancient and Medieval China, Ancient and Medieval India, The Mathematics of Islam, Mathematics in Medieval Europe, Mathematics in the Renaissance, Precalculus in the Seventeenth Century, Calculus in the Seventeenth Century, Analysis in the Eighteenth Century, Probability and Statistics in the Eighteenth Century, Algebra and Number Theory in the Eighteenth Century, Geometry in the Eighteenth Century, Algebra and Number Theory in the Nineteenth Century, Analysis in the Nineteenth Century, Statistics in the Nineteenth Century, Geometry in the Nineteenth Century, Aspects of the Twentieth Century For all readers interested in the history of mathematics.