

# Mathematics From The Birth Of Numbers

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**The School of Numbers** - Emily Hawkins  
2019-03-05

Greetings Cadet! Congratulations on being accepted into the prestigious Astro Academy for math! Now strap on your space boots, secure you helmet and let's get ready for a mathematical journey like no other! Hop on board the spaceship School of Numbers and head off on an intergalactic mathematical journey that will introduce young readers to key concepts including arithmetic, shapes, fractions, percentages, and sequences. Six eccentric professors will teach budding space mathematic Cadets all there is to know about the world of numbers! Meet Captain Archimedes Brown who keeps everyone in order; Lois Carmen Denominator who's got a passion for fractions; Di Ameter who's a stickler for geometry; Al Jabra who loves algebra; Ava Ridge who's looney for statistics; and last but certainly not least, Adam Up who just can't get enough of arithmetic! Float into this gravity-free classroom, prepare yourself for antics aplenty and get ready to see math in action like never before.

**The Geometry of Numbers** - C. D. Olds 2000  
A self-contained introduction to the geometry of numbers.

*The Mathematical Traveler* - Calvin C. Clawson  
2013-11-11

As he persuasively argues, the mathematical concepts that arose and flourished in the ancient world enabled the creation of architectural masterpieces as well as the establishment of vast trade networks.

**Numbers** - Heinz-Dieter Ebbinghaus 1991

This book is about all kinds of numbers, from rationals to octonians, reals to infinitesimals. It is a story about a major thread of mathematics over thousands of years, and it answers everything from why Hamilton was obsessed with quaternions to what the prospect was for quaternionic analysis in the 19th century. It glimpses the mystery surrounding imaginary numbers in the 17th century and views some major developments of the 20th century.

*Elements of Number Theory* - I. M. Vinogradov  
2016-01-14

Clear, detailed exposition that can be understood by readers with no background in advanced mathematics. More than 200 problems and full solutions, plus 100 numerical exercises. 1949 edition.

**The Mathematics of the Gods and the Algorithms of Men** - Paolo Zellini 2020-02-27

Is mathematics a discovery or an invention? Do numbers truly exist? What sort of reality do formulas describe? The complexity of mathematics - its abstract rules and obscure symbols - can seem very distant from the everyday. There are those things that are real and present, it is supposed, and then there are mathematical concepts: creations of our mind, mysterious tools for those unengaged with the world. Yet, from its most remote history and deepest purpose, mathematics has served not just as a way to understand and order, but also as a foundation for the reality it describes. In this elegant book, mathematician and philosopher Paolo Zellini offers a brief cultural and intellectual history of mathematics, ranging widely from the paradoxes of ancient Greece to

the sacred altars of India, from Mesopotamian calculus to our own contemporary obsession with algorithms. Masterful and illuminating, *The Mathematics of the Gods and the Algorithms of Men* transforms our understanding of mathematical thinking, showing that it is inextricably linked with the philosophical and the religious as well as the mundane - and, indeed, with our own very human experience of the universe.

**17 Lectures on Fermat Numbers** - Michal Krizek 2013-03-14

The pioneering work of Pierre de Fermat has attracted the attention of mathematicians for over 350 years. This book provides an overview of the many properties of Fermat numbers and demonstrates their applications in areas such as number theory, probability theory, geometry, and signal processing. It is an ideal introduction to the basic mathematical ideas and algebraic methods connected with the Fermat numbers.

*An Illustrated Theory of Numbers* - Martin H. Weissman 2020-09-15

News about this title: — Author Marty Weissman has been awarded a Guggenheim Fellowship for 2020. (Learn more here.) — Selected as a 2018 CHOICE Outstanding Academic Title — 2018 PROSE Awards Honorable Mention *An Illustrated Theory of Numbers* gives a comprehensive introduction to number theory, with complete proofs, worked examples, and exercises. Its exposition reflects the most recent scholarship in mathematics and its history. Almost 500 sharp illustrations accompany elegant proofs, from prime decomposition through quadratic reciprocity. Geometric and dynamical arguments provide new insights, and allow for a rigorous approach with less algebraic manipulation. The final chapters contain an extended treatment of binary quadratic forms, using Conway's topograph to solve quadratic Diophantine equations (e.g., Pell's equation) and to study reduction and the finiteness of class numbers. Data visualizations introduce the reader to open questions and cutting-edge results in analytic number theory such as the Riemann hypothesis, boundedness of prime gaps, and the class number 1 problem. Accompanying each chapter, historical notes curate primary sources and secondary scholarship to trace the development of number

theory within and outside the Western tradition. Requiring only high school algebra and geometry, this text is recommended for a first course in elementary number theory. It is also suitable for mathematicians seeking a fresh perspective on an ancient subject.

*The History of Mathematics* - Roger L. Cooke 2011-02-14

This new edition brings the fascinating and intriguing history of mathematics to life. The Second Edition of this internationally acclaimed text has been thoroughly revised, updated, and reorganized to give readers a fresh perspective on the evolution of mathematics. Written by one of the world's leading experts on the history of mathematics, the book details the key historical developments in the field, providing an understanding and appreciation of how mathematics influences today's science, art, music, literature, and society. In the first edition, each chapter was devoted to a single culture. This Second Edition is organized by subject matter: a general survey of mathematics in many cultures, arithmetic, geometry, algebra, analysis, and mathematical inference. This new organization enables students to focus on one complete topic and, at the same time, compare how different cultures approached each topic. Many new photographs and diagrams have been added to this edition 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, cultural surveys, and women mathematicians; *Numbers*, including counting, calculation, ancient number theory, and numbers and number theory in modern mathematics; *Color Plates*, illustrating the impact of mathematics on civilizations 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 and methods, and modern algebra; *Analysis*, including the calculus, real, and complex analysis; *Mathematical Inference*, including probability and statistics, and logic and set theory. As readers progress through the text, they learn about the evolution of each topic, how different cultures devised their own solutions, and how these solutions enabled the cultures to

development and progress. In addition, readers will meet some of the greatest mathematicians of the ages, who helped lay the groundwork for today's science and technology. The book's lively approach makes it appropriate for anyone interested in learning how the field of mathematics came to be what it is today. It can also serve as a textbook for undergraduate or graduate-level courses. An Instructor's Manual presenting detailed solutions to all the problems in the book is available upon request from the Wiley editorial department.

**Mathematics** - Britannica Educational Publishing 2015-01-01

This insightful guide to the history and basic concepts of mathematics reveals how math concepts helped to shape society--from the basic counting and units of measurement that facilitated commerce to the kind of surveying techniques and geometry that helped build the Egyptian pyramids. A chronological account of advancements in mathematics ranges from Aristotle and al-Khwarizmi (who first used the term "algebra") to high-speed computers and their impact upon the teaching and understanding of mathematics. Readers will also find out how much of ancient arithmetic--like the 60 minute hour--is still part of our everyday life.

*Advanced Problems in Mathematics: Preparing for University* - Stephen Siklos 2016-01-25

This book is intended to help candidates prepare for entrance examinations in mathematics and scientific subjects, including STEP (Sixth Term Examination Paper). STEP is an examination used by Cambridge colleges as the basis for conditional offers. They are also used by Warwick University, and many other mathematics departments recommend that their applicants practice on the past papers even if they do not take the examination. *Advanced Problems in Mathematics* is recommended as preparation for any undergraduate mathematics course, even for students who do not plan to take the Sixth Term Examination Paper. The questions analysed in this book are all based on recent STEP questions selected to address the syllabus for Papers I and II, which is the A-level core (i.e. C1 to C4) with a few additions. Each question is followed by a comment and a full solution. The comments direct the reader's attention to key points and put the question in

its true mathematical context. The solutions point students to the methodology required to address advanced mathematical problems critically and independently. This book is a must read for any student wishing to apply to scientific subjects at university level and for anybody interested in advanced mathematics.

*The World of Mathematics* - James Roy Newman 1966

*The New York Times Book of Mathematics* - Gina Bari Kolata 2013

Presents a selection from the archives of the New York newspaper of its writings on mathematics from 1892 to 2010, covering such topics as chaos theory, statistics, cryptography, and computers.

**The New Mathematics** - Irving Adler 1972

**Mathematics From the Birth of Numbers** - Jan Gullberg 1997-01-07

An illustrated exploration of mathematics and its history, beginning with a study of numbers and their symbols, and continuing with a broad survey that includes consideration of algebra, geometry, hyperbolic functions, fractals, and many other mathematical functions.

*Fibonacci Numbers* - Nikolai Nikolaevich Vorob'ev 2013-04-10

An engaging treatment of an 800-year-old problem explores the occurrence of Fibonacci numbers in number theory, continued fractions, and geometry. Its entertaining style will appeal to recreational readers and students alike.

**Proofs from THE BOOK** - Martin Aigner 2013-06-29

According to the great mathematician Paul Erdős, God maintains perfect mathematical proofs in *The Book*. This book presents the authors' candidates for such "perfect proofs," those which contain brilliant ideas, clever connections, and wonderful observations, bringing new insight and surprising perspectives to problems from number theory, geometry, analysis, combinatorics, and graph theory. As a result, this book will be fun reading for anyone with an interest in mathematics.

**What Is Mathematics, Really?** - Reuben Hersh 1997-08-21

Most philosophers of mathematics treat it as isolated, timeless, ahistorical, inhuman. Reuben

Hersh argues the contrary, that mathematics must be understood as a human activity, a social phenomenon, part of human culture, historically evolved, and intelligible only in a social context. Hersh pulls the screen back to reveal mathematics as seen by professionals, debunking many mathematical myths, and demonstrating how the "humanist" idea of the nature of mathematics more closely resembles how mathematicians actually work. At the heart of his book is a fascinating historical account of the mainstream of philosophy--ranging from Pythagoras, Descartes, and Spinoza, to Bertrand Russell, David Hilbert, and Rudolph Carnap--followed by the mavericks who saw mathematics as a human artifact, including Aristotle, Locke, Hume, Mill, and Lakatos. *What is Mathematics, Really?* reflects an insider's view of mathematical life, and will be hotly debated by anyone with an interest in mathematics or the philosophy of science.

**Mathematics and Its History** - John Stillwell  
2020-11-07

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 book...is 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  
**The Penguin Book of Curious and Interesting Mathematics** - David G. Wells  
1997

Collection of miscellaneous facts and anecdotes from mathematicians.

**Excursions in Number Theory** - Charles Stanley Ogilvy  
1988-01-01

Challenging, accessible mathematical adventures involving prime numbers, number patterns, irrationals and iterations, calculating prodigies, and more. No special training is needed, just high school mathematics and an inquisitive mind. "A splendidly written, well selected and presented collection. I recommend the book unreservedly to all readers." — Martin Gardner.

**Making up Numbers: A History of Invention in Mathematics** - Ekkehard Kopp  
2020-10-23

*Making up Numbers: A History of Invention in Mathematics* offers a detailed but accessible account of a wide range of mathematical ideas. Starting with elementary concepts, it leads the reader towards aspects of current mathematical research. The book explains how conceptual hurdles in the development of numbers and number systems were overcome in the course of history, from Babylon to Classical Greece, from the Middle Ages to the Renaissance, and so to the nineteenth and twentieth centuries. The narrative moves from the Pythagorean insistence

on positive multiples to the gradual acceptance of negative numbers, irrationals and complex numbers as essential tools in quantitative analysis. Within this chronological framework, chapters are organised thematically, covering a variety of topics and contexts: writing and solving equations, geometric construction, coordinates and complex numbers, perceptions of 'infinity' and its permissible uses in mathematics, number systems, and evolving views of the role of axioms. Through this approach, the author demonstrates that changes in our understanding of numbers have often relied on the breaking of long-held conventions to make way for new inventions at once providing greater clarity and widening mathematical horizons. Viewed from this historical perspective, mathematical abstraction emerges as neither mysterious nor immutable, but as a contingent, developing human activity. Making up Numbers will be of great interest to undergraduate and A-level students of mathematics, as well as secondary school teachers of the subject. In virtue of its detailed treatment of mathematical ideas, it will be of value to anyone seeking to learn more about the development of the subject.

Where Mathematics Come From How The Embodied Mind Brings Mathematics Into Being - George Lakoff 2000-11-02

A study of the cognitive science of mathematical ideas.

**Numbers and Infinity** - E. H. Sondheim 2006-01-01

This fresh overview of numbers and infinity avoids tedium and controversy while maintaining historical accuracy and modern relevance. Perfect for undergraduate mathematics or science history courses. 1981 edition.

**Set Theory** - Abhijit Dasgupta 2013-12-11  
What is a number? What is infinity? What is continuity? What is order? Answers to these fundamental questions obtained by late nineteenth-century mathematicians such as Dedekind and Cantor gave birth to set theory. This textbook presents classical set theory in an intuitive but concrete manner. To allow flexibility of topic selection in courses, the book is organized into four relatively independent parts with distinct mathematical flavors. Part I begins with the Dedekind–Peano axioms and

ends with the construction of the real numbers. The core Cantor–Dedekind theory of cardinals, orders, and ordinals appears in Part II. Part III focuses on the real continuum. Finally, foundational issues and formal axioms are introduced in Part IV. Each part ends with a postscript chapter discussing topics beyond the scope of the main text, ranging from philosophical remarks to glimpses into landmark results of modern set theory such as the resolution of Lusin's problems on projective sets using determinacy of infinite games and large cardinals. Separating the metamathematical issues into an optional fourth part at the end makes this textbook suitable for students interested in any field of mathematics, not just for those planning to specialize in logic or foundations. There is enough material in the text for a year-long course at the upper-undergraduate level. For shorter one-semester or one-quarter courses, a variety of arrangements of topics are possible. The book will be a useful resource for both experts working in a relevant or adjacent area and beginners wanting to learn set theory via self-study.

*Mathematics and the Divine* - Teun Koetsier 2004-12-09

Mathematics and the Divine seem to correspond to diametrically opposed tendencies of the human mind. Does the mathematician not seek what is precisely defined, and do the objects intended by the mystic and the theologian not lie beyond definition? Is mathematics not Man's search for a measure, and isn't the Divine that which is immeasurable? The present book shows that the domains of mathematics and the Divine, which may seem so radically separated, have throughout history and across cultures, proved to be intimately related. Religious activities such as the building of temples, the telling of ritual stories or the drawing of enigmatic figures all display distinct mathematical features. Major philosophical systems dealing with the Absolute and theological speculations focussing on our knowledge of the Ultimate have been based on or inspired by mathematics. A series of chapters by an international team of experts highlighting key figures, schools and trains of thought is presented here. Chinese number mysticism, the

views of Pythagoras and Plato and their followers, Nicholas of Cusa's theological geometry, Spinozism and intuitionism as a philosophy of mathematics are treated side by side among many other themes in an attempt at creating a global view on the relation of mathematics and Man's quest for the Absolute in the course of history. · Mathematics and man's quest for the Absolute · A selective history highlighting key figures, schools and trains of thought · An international team of historians presenting specific new findings as well as general overviews · Confronting and uniting otherwise compartmentalized information

**Mathematics for Everyman** - Egmont Colerus  
2013-02-04

This witty and engaging stylebook presents the fundamentals of mathematical operations: number systems, first steps in algebra and algebraic notation, common fractions and equations, and much more. 1958 edition.

Numbers - Graham Flegg 2013-05-13

Readable, jargon-free book examines the earliest endeavors to count and record numbers, initial attempts to solve problems by using equations, and origins of infinite cardinal arithmetic.

"Surprisingly exciting." — Choice.

Mathematics and the Imagination - Edward Kasner 2013-04-22

With wit and clarity, the authors progress from simple arithmetic to calculus and non-Euclidean geometry. Their subjects: geometry, plane and fancy; puzzles that made mathematical history; tantalizing paradoxes; more. Includes 169 figures.

Number Theory and Its History - Oystein Ore  
2012-07-06

Unusually clear, accessible introduction covers counting, properties of numbers, prime numbers, Aliquot parts, Diophantine problems, congruences, much more. Bibliography.

**Mathematics from Birth to Numbers** - Jan Gullberg 1997

The Math Gene - Keith Devlin 2001-05-17

Why is math so hard? And why, despite this difficulty, are some people so good at it? If there's some inborn capacity for mathematical thinking—which there must be, otherwise no one could do it—why can't we all do it well? Keith Devlin has answers to all these difficult

questions, and in giving them shows us how mathematical ability evolved, why it's a part of language ability, and how we can make better use of this innate talent. He also offers a breathtakingly new theory of language development—that language evolved in two stages, and its main purpose was not communication—to show that the ability to think mathematically arose out of the same symbol-manipulating ability that was so crucial to the emergence of true language. Why, then, can't we do math as well as we can speak? The answer, says Devlin, is that we can and do—we just don't recognize when we're using mathematical reasoning.

The Number System - H. A. Thurston 2012-10-23

This book explores arithmetic's underlying concepts and their logical development, in addition to a detailed, systematic construction of the number systems of rational, real, and complex numbers. 1956 edition.

Power in Numbers - Talithia Williams  
2018-04-10

From rocket scientists to code breakers, discover the incredibly inspiring stories of more than 30 women who fought through the obstacles, shattered the stereotypes, and embraced their STEM passions. Prepare to be inspired. With more than 200 photos and original interviews with several of the amazing women covered, *Power in Numbers: The Rebel Women of Mathematics* is a full-color volume that takes aim at the forgotten influence of women on the development of mathematics over the last two millennia. Each biography reveals the amazing life of a different female mathematician, from her childhood and early influences, to the obstacles she faced and the great achievements she made in spite of them. Learn how: After her father terminated her math lessons, Sofia Kovalevskaya snuck algebra books into her bed to read at night. Emmy Noether became an invaluable resource to Albert Einstein while she was in the Navy. Native American rocket scientist Mary Golda Ross developed designs for fighter jets and missiles in a top-secret unit. Katherine Johnson's life-or-death calculations at NASA meant that astronauts such as Alan Shepard and John Glenn made it home alive. Shakuntala Devi multiplied massive numbers in her head so her family could

eat at night. Pamela Harris proved her school counselors wrong when they told her she would only succeed as a bilingual secretary. Carla Cotwright-Williams began her life in the dangerous streets of South-Central Los Angeles before skyrocketing to a powerful career with the Department of Defense in Washington DC. One thing uniting these women's stories is that at some point on their journeys, someone believed in them; someone made them think the impossible was perhaps not so impossible. May their stories empower the next generation of STEM rebels to continue advancing mathematical theory, bringing awareness to the field, and increasing our Power in Numbers.

**How Numbers Work** - New Scientist  
2018-03-21

Think of a number between one and ten. No, hang on, let's make this interesting. Between zero and infinity. Even if you stick to the whole numbers, there are a lot to choose from - an infinite number in fact. Throw in decimal fractions and infinity suddenly gets an awful lot bigger (is that even possible?) And then there are the negative numbers, the imaginary numbers, the irrational numbers like pi which never end. It literally never ends. The world of numbers is indeed strange and beautiful. Among its inhabitants are some really notable characters - pi, e, the "imaginary" number i and the famous golden ratio to name just a few. Prime numbers occupy a special status. Zero is very odd indeed: is it a number, or isn't it? How Numbers Work takes a tour of this mind-blowing but beautiful realm of numbers and the mathematical rules that connect them. Not only that, but take a crash course on the biggest unsolved problems that keep mathematicians up at night, find out about the strange and unexpected ways mathematics influences our everyday lives, and discover the incredible connection between numbers and reality itself. ABOUT THE SERIES New Scientist Instant Expert books are definitive and accessible entry points to the most important subjects in science; subjects that challenge, attract debate, invite controversy and engage the most enquiring minds. Designed for curious readers who want to know how things work and why, the Instant Expert series explores the topics that really matter and their impact on individuals, society,

and the planet, translating the scientific complexities around us into language that's open to everyone, and putting new ideas and discoveries into perspective and context.

*An Adventurer's Guide to Number Theory* - Richard Friedberg 2012-07-06

This witty introduction to number theory deals with the properties of numbers and numbers as abstract concepts. Topics include primes, divisibility, quadratic forms, and related theorems.

*Are Numbers Real?* - Brian Clegg 2016-12-06

Have you ever wondered what humans did before numbers existed? How they organized their lives, traded goods, or kept track of their treasures? What would your life be like without them? Numbers began as simple representations of everyday things, but mathematics rapidly took on a life of its own, occupying a parallel virtual world. In *Are Numbers Real?*, Brian Clegg explores the way that math has become more and more detached from reality, and yet despite this is driving the development of modern physics. From devising a new counting system based on goats, through the weird and wonderful mathematics of imaginary numbers and infinity, to the debate over whether mathematics has too much influence on the direction of science, this fascinating and accessible book opens the reader's eyes to the hidden reality of the strange yet familiar entities that are numbers.

**The Man of Numbers** - Keith Devlin  
2012-11-01

In 1202, a 32-year old Italian finished one of the most influential books of all time, which introduced modern arithmetic to Western Europe. Devised in India in the seventh and eighth centuries and brought to North Africa by Muslim traders, the Hindu-Arabic system helped transform the West into the dominant force in science, technology, and commerce, leaving behind Muslim cultures which had long known it but had failed to see its potential. The young Italian, Leonardo of Pisa (better known today as Fibonacci), had learned the Hindu number system when he traveled to North Africa with his father, a customs agent. The book he created was *Liber abbaci*, the 'Book of Calculation', and the revolution that followed its publication was enormous. Arithmetic made it possible for

ordinary people to buy and sell goods, convert currencies, and keep accurate records of possessions more readily than ever before. Liber abbaci's publication led directly to large-scale international commerce and the scientific revolution of the Renaissance. Yet despite the ubiquity of his discoveries, Leonardo of Pisa remains an enigma. His name is best known today in association with an exercise in Liber abbaci whose solution gives rise to a sequence of numbers - the Fibonacci sequence - used by some to predict the rise and fall of financial markets, and evident in myriad biological structures. In *The Man of Numbers*, Keith Devlin recreates the life and enduring legacy of an overlooked genius, and in the process makes clear how central numbers and mathematics are to our daily lives.

*Numbers in Motion* - Laurie Wallmark 2020

"This picture book traces the impressive career of Sophie Kowalevski, the first woman to receive a doctorate in mathematics requiring original research. As a girl, Sophie is fascinated by the equations her father uses to wallpaper her room. She proves herself a prodigy, and tutors are impressed enough to give her private lessons. Despite universities that refuse to allow women on campus or to pay them to teach, Sophie is able to distinguish herself with her research into partial differential equations. Sophie receives a doctorate and becomes the first female professional mathematician in Northern Europe. The book mentions several of Kowalevski's

mathematical contributions and closes with an encouraging message about women in mathematics"--

*Understanding Numbers in Elementary School Mathematics* - Hongxi Wu 2011

This is a textbook for pre-service elementary school teachers and for current teachers who are taking professional development courses. By emphasizing the precision of mathematics, the exposition achieves a logical and coherent account of school mathematics at the appropriate level for the readership. Wu provides a comprehensive treatment of all the standard topics about numbers in the school mathematics curriculum: whole numbers, fractions, and rational numbers. Assuming no previous knowledge of mathematics, the presentation develops the basic facts about numbers from the beginning and thoroughly covers the subject matter for grades K through 7. Every single assertion is established in the context of elementary school mathematics in a manner that is completely consistent with the basic requirements of mathematics. While it is a textbook for pre-service elementary teachers, it is also a reference book that school teachers can refer to for explanations of well-known but hitherto unexplained facts. For example, the sometimes-puzzling concepts of percent, ratio, and rate are each given a treatment that is down to earth and devoid of mysticism. The fact that a negative times a negative is a positive is explained in a leisurely and comprehensible fashion.