

Mathematics In Ancient Greece Tobias Dantzig

Explores Thales's speculative philosophy through a study of geometrical diagrams. Bringing together geometry and philosophy, this book undertakes a strikingly original study of the origins and significance of the Pythagorean theorem. Thales, whom Aristotle called the first philosopher and who was an older contemporary of Pythagoras, posited the principle of a unity from which all things come, and back into which they return upon dissolution. He held that all appearances are only alterations of this basic unity and there can be no change in the cosmos. Such an account requires some fundamental geometric figure out of which appearances are structured. Robert Hahn argues that Thales came to the conclusion that it was the right triangle: by recombination and repackaging, all alterations can be explained from that figure. This idea is central to what the discovery of the Pythagorean theorem could have meant to Thales and Pythagoras in the sixth century BCE. With more than two hundred illustrations and figures, Hahn provides a

series of geometric proofs for this lost narrative, tracing it from Thales to Pythagoras and the Pythagoreans who followed, and then finally to Plato's Timaeus. Uncovering the philosophical motivation behind the discovery of the theorem, Hahn's book will enrich the study of ancient philosophy and mathematics alike.

Erudite and entertaining overview follows development of mathematics from ancient Greeks to present. Topics include logic and mathematics, the fundamental concept, differential calculus, probability theory, much more. Exercises and problems.

From Rubik's cubes to Godel's incompleteness theorem, everything mathematical explained, with colour illustrations, in half a minute. Maths is enjoying a resurgence in popularity. So how can you avoid being the only dinner guest who has no idea who Fermat was, or what he proved? The more you know about Maths, the less of a science it becomes. 30 Second Maths takes the top 50 most engaging mathematical theories, and explains them to the general reader in half a minute, using nothing

more than two pages, 200 words and one picture. Read at your own pace, and discover that maths can be more fascinating than you ever imagined.

An Introduction to the History of Mathematics

Tools and Mathematics

Mathematics for the Nonmathematician

Non-European Roots of Mathematics

Guide to Discrete Mathematics

Arguing with Numbers

A Brief History of Mathematical Thought

An exploration of one of the most celebrated and well-known theorems in mathematics. By any measure, the Pythagorean theorem is the most famous statement in all of mathematics. In this book, Eli Maor reveals the full story of this ubiquitous geometric theorem. Although attributed to Pythagoras, the theorem was known to the Babylonians more than a thousand years earlier. Pythagoras may have been the first to prove it, but his proof—if indeed he had one—is lost to us. The theorem itself, however, is central to almost every branch of science, pure or applied. Maor brings to life many of the characters that played

a role in its history, providing a fascinating backdrop to perhaps our oldest enduring mathematical legacy.

Friedrich Kittler was one of the world's most influential, provocative and misunderstood media theorists. His work spans analyses of historical 'discourse networks' inspired by French poststructuralism, influential theorizations of new media, through to musings on music and mathematics. Always controversial and relentlessly unpredictable, Kittler's work is a major reference point for contemporary media theory, literary criticism and cultural studies. This is the only book of essays currently available in English on an important thinker whose influence across disciplines is growing. The volume situates Kittler's ideas, explaining and critiquing his sometimes difficult writing, and using his theories to undertake innovative readings of old and new media. It also includes previously untranslated work by Kittler himself. Contributors include Caroline Bassett, Steven Connor, Alexander R. Galloway, Mark B. Hansen, John Durham Peters and Geoffrey Winthrop-Young.

This book is an exploration of tools and mathematics and issues in mathematics education related to tool use. The book has five parts.

The first part reflects on doing a mathematical task with different tools, followed by a mathematician's account of tool use in his work. The second considers prehistory and history: tools in the development from ape to human; tools and mathematics in the ancient world; tools for calculating; and tools in mathematics instruction. The third part opens with a broad review of technology and intellectual trends, circa 1970, and continues with three case studies of approaches in mathematics education and the place of tools in these approaches. The fourth part considers issues related to mathematics instructions: curriculum, assessment and policy; the calculator debate; mathematics in the real world; and teachers' use of technology. The final part looks to the future: task and tool design and new forms of activity via connectivity and computer games.

Aristotle's Metaphysics Lambda

Number

The Intersections of Rhetoric and Mathematics

Stalking the Second Tier

Current Perspectives in Kittler Studies

Euclid in the Rainforest

A Contextual History

The author, G. J. Chaitin, shows that God plays dice not only in quantum mechanics but also in the foundations of mathematics. According to Chaitin there exist mathematical facts that are true for no reason. This fascinating and provocative text contains a collection of his most wide-ranging and non-technical lectures and interviews. It will be of interest to anyone concerned with the philosophy of mathematics, the similarities and differences between physics and mathematics, and mathematics as art.

The epic tale of an ancient, unsolved puzzle and how it relates to all scientific attempts to explain the basic structure of the universe At the dawn of science the ancient Greek philosopher Zeno formulated his paradox of motion, and amazingly, it is still on the cutting edge of all investigations into the fabric of reality. Zeno used logic to argue that motion is impossible, and at the heart of his maddening puzzle is the nature of space and time. Is space-time continuous or broken up like a string of beads? Over the past two millennia, many of our greatest minds—including Aristotle, Galileo, Newton, Einstein, Stephen Hawking, and other current theoreticians—have been gripped by the mystery this puzzle represents. Joseph Mazur, acclaimed author of *Euclid in the Rainforest*, shows how historic breakthroughs in our understanding of motion shed light on Zeno's paradox. The orbits of the planets were explained, the laws of motion were revealed, the theory of relativity was discovered—but the basic structure of time and space remained elusive. In

the tradition of Fermat's Enigma and Zero, The Motion Paradox is a lively history of this apparently simple puzzle whose solution—if indeed it can be solved—will reveal nothing less than the fundamental nature of reality.

Mathematics is a product of human culture which has developed along with our attempts to comprehend the world around us. In *A Brief History of Mathematical Thought*, Luke Heaton explores how the language of mathematics has evolved over time, enabling new technologies and shaping the way people think. From stone-age rituals to algebra, calculus, and the concept of computation, Heaton shows the enormous influence of mathematics on science, philosophy and the broader human story. The book traces the fascinating history of mathematical practice, focusing on the impact of key conceptual innovations. Its structure of thirteen chapters split between four sections is dictated by a combination of historical and thematic considerations. In the first section, Heaton illuminates the fundamental concept of number. He begins with a speculative and rhetorical account of prehistoric rituals, before describing the practice of mathematics in Ancient Egypt, Babylon and Greece. He then examines the relationship between counting and the continuum of measurement, and explains how the rise of algebra has dramatically transformed our world. In the second section, he explores the origins of calculus and the conceptual shift that accompanied the birth of non-Euclidean geometries. In the third section, he examines the concept of the infinite and the fundamentals of formal logic.

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Finally, in section four, he considers the limits of formal proof, and the critical role of mathematics in our ongoing attempts to comprehend the world around us. The story of mathematics is fascinating in its own right, but Heaton does more than simply outline a history of mathematical ideas. More importantly, he shows clearly how the history and philosophy of maths provides an invaluable perspective on human nature.

The Wonder Book of Geometry

From Pythagoras to Schoenberg

The History of Mathematics

Zero

Thales, Pythagoras, Engineering, Diagrams, and the Construction of the Cosmos out of Right Triangles

The Motion Paradox

The Miscellaneous Writings of Tobias Smollett

Important study focuses on the revival and assimilation of ancient Greek mathematics in the 13th-16th centuries, via Arabic science, and the 16th-century development of symbolic algebra. This brought about the crucial change in the concept of number that made possible modern science – in which the symbolic "form" of a mathematical statement is completely inseparable from its

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"content" of physical meaning. Includes a translation of Vieta's Introduction to the Analytical Art. 1968 edition. Bibliography. In this annotated critical edition of Aristotle's Metaphysics Lambda Stefan Alexandru draws upon many hitherto unexplored sources of the direct and indirect tradition, inter alia upon an independent Greek manuscript he has discovered in the Vatican Library.

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

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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.

How to Think Like a Mathematician

Decisions in Syracuse

The Ancient Roots of Modern Science--from the Baby

They're Not Dumb, They're Different

A Companion to Undergraduate Mathematics

Key concepts and where they come from

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Music by the Numbers

This stimulating textbook presents a broad and accessible guide to the fundamentals of discrete mathematics, highlighting how the techniques may be applied to various exciting areas in computing. The text is designed to motivate and inspire the reader, encouraging further study in this important skill. Features: provides an introduction to the building blocks of discrete mathematics, including sets, relations and functions; describes the basics of number theory, the techniques of induction and recursion, and the applications of mathematical sequences, series, permutations, and combinations; presents the essentials of algebra; explains the fundamentals of automata theory, matrices, graph theory, cryptography, coding theory, language theory, and the concepts of computability and decidability; reviews the history of logic, discussing propositional and predicate logic, as well as advanced topics; examines the field of software engineering, describing formal methods; investigates probability and statistics.

This review of the work done to date on the computer modelling of mathematical reasoning processes brings together a variety of approaches and disciplines within a coherent frame. A limited knowledge of mathematics is assumed in the introduction to the principles of mathematical logic. The plan of the book is such that students with varied backgrounds can find necessary information as quickly as possible. Exercises are included throughout the book.

Examines the early developments and uses of mathematics in such places as Egypt,

Mesopotamia, China, and India

30-Second Maths

The Metaphysics of the Pythagorean Theorem

Conversations with a Mathematician

Mathematics in Ancient Egypt

The Language of Science

Lost Discoveries

A Critical Survey Written for the Cultured Non-mathematician

As discrete fields of inquiry, rhetoric and mathematics have long been considered antithetical to each other. That is, if mathematics explains or describes the phenomena it studies with certainty, persuasion is not needed. This volume calls into question the view that mathematics is free of rhetoric. Through nine studies of the intersections between these two disciplines, *Arguing with Numbers* shows that mathematics is in fact deeply rhetorical. Using rhetoric as a lens to analyze mathematically based arguments in public policy, political and economic theory, and even literature, the essays in this volume reveal how mathematics influences the values and beliefs with which we assess the world and make decisions and how our worldviews influence the kinds of mathematical instruments we construct and accept. In addition, contributors examine how concepts of rhetoric—such as analogy

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and visuality—have been employed in mathematical and scientific reasoning, including in the theorems of mathematical physicists and the geometrical diagramming of natural scientists. Challenging academic orthodoxy, these scholars reject a math-equals-truth reduction in favor of a more constructivist theory of mathematics as dynamic, evolving, and powerfully persuasive. By bringing these disparate lines of inquiry into conversation with one another, *Arguing with Numbers* provides inspiration to students, established scholars, and anyone inside or outside rhetorical studies who might be interested in exploring the intersections between the two disciplines. In addition to the editors, the contributors to this volume are Catherine Chaput, Crystal Broch Colombini, Nathan Crick, Michael Dreher, Jeanne Fahnestock, Andrew C. Jones, Joseph Little, and Edward Schiappa.

A NEW YORK TIMES NOTABLE BOOK The Babylonians invented it, the Greeks banned it, the Hindus worshipped it, and the Christian Church used it to fend off heretics. Today it's a timebomb ticking in the heart of astrophysics. For zero, infinity's twin, is not like other numbers. It is both nothing and everything. Zero has pitted East against West and faith against reason, and its intransigence persists in the dark core of a black hole and the brilliant flash of the Big Bang. Today, zero lies at the heart of one of the biggest scientific controversies of all time: the quest for a theory of everything.

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Within the concept of zero lies a philosophical and scientific history of humanity. Charles Seife's elegant and witty account takes us from Aristotle to superstring theory by way of Egyptian geometry, Kabbalism, Einstein, the Chandrasekhar limit and Stephen Hawking. Covering centuries of thought, it is a concise tour of a world of ideas, bound up in the simple notion of nothing.

"Our understanding of how the human brain performs mathematical calculations is far from complete. In *The Number Sense*, Stanislas Dehaene offers readers an enlightening exploration of the mathematical mind. Using research showing that human infants have a rudimentary number sense, Dehaene suggests that this sense is as basic as our perception of color, and that it is wired into the brain. But how then did we leap from this basic number ability to trigonometry, calculus, and beyond? Dehaene shows that it was the invention of symbolic systems of numerals that started us on the climb to higher mathematics. Tracing the history of numbers, we learn that in early times, people indicated numbers by pointing to part of their bodies, and how Roman numerals were replaced by modern numbers. On the way, we also discover many fascinating facts: for example, because Chinese names for numbers are short, Chinese people can remember up to nine or ten digits at a time, while English-speaking people can only remember

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seven. A fascinating look at the crossroads where numbers and neurons intersect, The Number Sense offers an intriguing tour of how the structure of the brain shapes our mathematical abilities, and how math can open up a window on the human mind"--Provided by publisher.

How Not to be Wrong

The Biography of a Dangerous Idea

Discovering Universal Truth in Logic and Math

The Crest of the Peacock

Tales of Physicists and Mathematicians

From Ahmes to Cantor

The Pythagorean Theorem

"The History of Mathematics: An Introduction," Sixth Edition, is written for the one- or two-semester math history course taken by juniors or seniors, and covers the history behind the topics typically covered in an undergraduate math curriculum or in elementary schools or high schools. Elegantly written in David Burton's imitable prose, this classic text provides rich historical context to the mathematics that undergrad math and math education majors encounter every day. Burton illuminates the people, stories, and social context behind mathematics'greatest historical

advances while maintaining appropriate focus on the mathematical concepts themselves. Its wealth of information, mathematical and historical accuracy, and renowned presentation make *The History of Mathematics: An Introduction, Sixth Edition* a valuable resource that teachers and students will want as part of a permanent library.

Lost Discoveries, Dick Teresi's innovative history of science, explores the unheralded scientific breakthroughs from peoples of the ancient world -- Babylonians, Egyptians, Indians, Africans, New World and Oceanic tribes, among others -- and the non-European medieval world. They left an enormous heritage in the fields of mathematics, astronomy, cosmology, physics, geology, chemistry, and technology. The mathematical foundation of Western science is a gift from the Indians, Chinese, Arabs, Babylonians, and Maya. The ancient Egyptians developed the concept of the lowest common denominator, and they developed a fraction table that modern scholars estimate required 28,000 calculations to compile. The Babylonians developed the first written math and used a place-value number system. Our numerals, 0 through 9, were invented in ancient India; the Indians also boasted geometry, trigonometry, and a kind of calculus. Planetary astronomy as well may have begun with the ancient Indians, who correctly

identified the relative distances of the known planets from the sun, and knew the moon was nearer to the earth than the sun was. The Chinese observed, reported, dated, recorded, and interpreted eclipses between 1400 and 1200 b.c. Most of the names of our stars and constellations are Arabic. Arabs built the first observatories. Five thousand years ago, the Sumerians said the earth was circular. In the sixth century, a Hindu astronomer taught that the daily rotation of the earth on its axis provided the rising and setting of the sun. Chinese and Arab scholars were the first to use fossils scientifically to trace earth's history. Chinese alchemists realized that most physical substances were merely combinations of other substances, which could be mixed in different proportions. Islamic scholars are legendary for translating scientific texts of many languages into Arabic, a tradition that began with alchemical books. In the eleventh century, Avicenna of Persia divined that outward qualities of metals were of little value in classification, and he stressed internal structure, a notion anticipating Mendeleev's periodic chart of elements. Iron suspension bridges came from Kashmir, printing from India; papermaking was from China, Tibet, India, and Baghdad; movable type was invented by Pi Sheng in about 1041; the Quechuan Indians of Peru were the first to vulcanize rubber; Andean

farmers were the first to freeze-dry potatoes. European explorers depended heavily on Indian and Filipino shipbuilders, and collected maps and sea charts from Javanese and Arab merchants. The first comprehensive, authoritative, popularly written, multicultural history of science, *Lost Discoveries* fills a crucial gap in the history of science.

Like Douglas Hofstadter's *Gödel, Escher, Bach*, and David Berlinski's *A Tour of the Calculus*, *Euclid in the Rainforest* combines the literary with the mathematical to explore logic—the one indispensable tool in man's quest to understand the world. Underpinning both math and science, it is the foundation of every major advancement in knowledge since the time of the ancient Greeks. Through adventure stories and historical narratives populated with a rich and quirky cast of characters, Mazur artfully reveals the less-than-airtight nature of logic and the muddled relationship between math and the real world. Ultimately, Mazur argues, logical reasoning is not purely robotic. At its most basic level, it is a creative process guided by our intuitions and beliefs about the world.

Quantitative Literacy

Annotated Critical Edition Based upon a Systematic Investigation of Greek, Latin, Arabic and Hebrew Sources

The Number Sense

The 50 Most Mind-Expanding Theories in Mathematics, Each Explained in Half a Minute

**The 2,500-Year Old Puzzle Behind All the Mysteries of Time and Space
The Bequest of the Greeks**

An Accessible Introduction to the History, Theory, Logic and Applications

This revised and greatly expanded edition of the Russian classic contains a wealth of new information about the lives of many great mathematicians and scientists, past and present. Written by a distinguished mathematician and featuring a unique mix of mathematics, physics, and history, this text combines original source material and provides careful explanations for some of the most significant discoveries in mathematics and physics. What emerges are intriguing, multifaceted biographies that will interest readers at all levels.

Written by a specialist in interpreting science for lay readers, this lively book recounts the human story behind mathematics, including the insights of such thinkers as Euclid and Hippocrates. 1955 edition.

Publisher Description

The Bungay Edition of Barclay's Dictionary greatly improved & superbly embellished
Adult Catalog: Subjects

Why Numeracy Matters for Schools and Colleges

A 4,000-Year History

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An Introduction

History of Political Economy

Kittler Now

How music has influenced mathematics, physics, and astronomy from ancient Greece to the twentieth century Music is filled with mathematical elements. The works of Bach are often said to possess a math-like logic, and Arnold Schoenberg, Iannis Xenakis, and Karlheinz Stockhausen wrote music explicitly based on mathematical principles. Yet Eli Maor argues that it is music that has had the greater influence on mathematics, not the other way around. Starting with Pythagoras, proceeding through Schoenberg, and bringing the story up to the present with contemporary string theory, *Music by the Numbers* tells a fascinating story of composers, scientists, inventors, and eccentrics who have played a role in the age-old relationship between music, mathematics, and the physical sciences. Weaving compelling stories of historical episodes with Maor's personal reflections as a mathematician and lover of classical music, this book will delight anyone who loves math and music. This arsenal of tips and techniques eases new students into

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undergraduate mathematics, unlocking the world of definitions, theorems, and proofs.

"Beyond doubt the most interesting book on the evolution of mathematics which has ever fallen into my hands."—Albert Einstein
Number is an eloquent, accessible tour de force that reveals how the concept of number evolved from prehistoric times through the twentieth century. Renowned professor of mathematics Tobias Dantzig shows that the development of math—from the invention of counting to the discovery of infinity—is a profoundly human story that progressed by “trying and erring, by groping and stumbling.” He shows how commerce, war, and religion led to advances in math, and he recounts the stories of individuals whose breakthroughs expanded the concept of number and created the mathematics that we know today.

Number, the Language of Science

How the Mind Creates Mathematics, Revised and Updated Edition

Mathematics in Ancient Greece

The Computer Modelling of Mathematical Reasoning

Greek Mathematical Thought and the Origin of Algebra

A Mathematical Story

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Math, Art, Science and the Limits of Reason

David Acheson transports us into the world of geometry, one of the oldest branches of mathematics. He describes its history, from ancient Greece to the present day, and its emphasis on proofs. With its elegant deduction and practical applications, he demonstrates how geometry offers the quickest route to the spirit of mathematics at its best.

The columnist for Slate's popular "Do the Math" celebrates the logical, illuminating nature of math in today's world, sharing in accessible language mathematical approaches that demystify complex and everyday problems.

Tobias Smollett (1721-71) is best known as a novelist; however this prolific and talented author was also a notable historian, literary critic, translator, medical writer and satirist. This volume will help us to reassess our understanding of Smollett by presenting some of his most significant miscellaneous writings in a new critical edition.

Subject Catalog

The Power of Mathematical Thinking