

Mathematical Mysteries

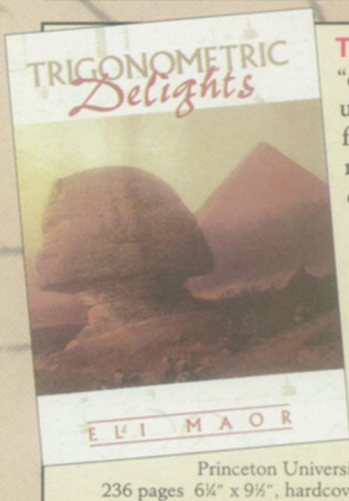
Today complex numbers have such widespread practical use—from electrical engineering to aeronautics—that few people would expect the story behind their derivation to be filled with adventure and enigma. In *An Imaginary Tale*, Paul Nahin tells the 2000-year-old history of one of mathematics' most elusive numbers, the square root of minus one, also known as i , re-creating 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, mathematical discussions, and 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.



Princeton University Press, 1998, 257 pages 6 1/4" x 9 1/4", hardcover, \$24.95



Trigonometry has always been the black sheep of mathematics. Too advanced to be part of “elementary math,” yet too elementary for the higher branches of the profession, it has been looked upon as a glorified form of geometry, complicated by tedious computation. Nothing could be further from the truth. Uniquely positioned as a meeting point between pure and applied mathematics, its rich history shows how different branches of science—among them geography, astronomy, physics, and even music—have influenced one another.

In this book, Eli Maor rejects the usual, arid descriptions of the sine and cosine functions and their trigonometric relatives. He brings the subject to life in a compelling blend of mathematics, history, and biography. From the “proto-trigonometry” of the Egyptian pyramid builders to Renaissance Europe's quest for more accurate artillery; from the earliest known trigonometric table, carved on a clay tablet by an unknown Babylonian scholar, to Fourier's famous theorem, which finally explained the source of musical harmony, here is a rich tapestry of almost four thousand years of trigonometric history.

The first part of the book assumes only high school algebra and trigonometry; the second part uses some elementary calculus. *Trigonometric Delights* will change forever our view of a once-dreaded subject.

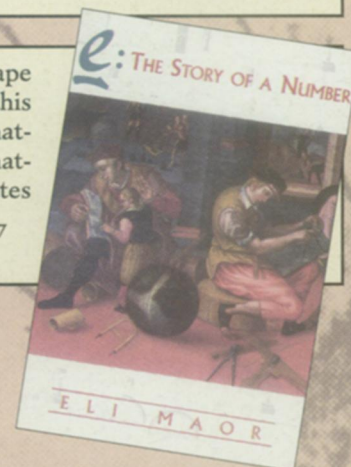
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—from Princeton University Press

The interest earned on a bank account, the arrangement of seeds in a sunflower, and the shape of the Gateway Arch in St. Louis are all intimately connected with the mysterious number e . In this informal and engaging history, Eli Maor portrays the curious characters and the elegant mathematics that lie behind the number. Designed for a reader with only a modest background in mathematics, this biography of e brings out that number's central importance in mathematics and illuminates a golden era in the age of science.

—Princeton University Press

Princeton University Press, 1994, 227 pages 6 1/4" x 9 1/4", paperback, \$14.95



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