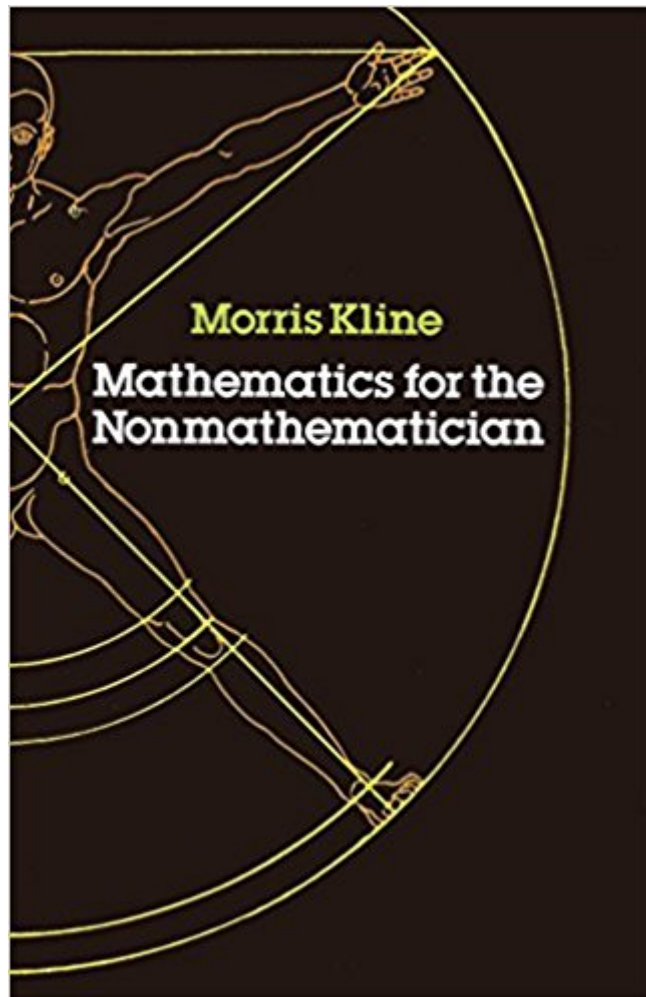


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Mathematics For The Nonmathematician (Dover Books On Mathematics)



Synopsis

Practical, scientific, philosophical, and artistic problems have caused men to investigate mathematics. But there is one other motive which is as strong as any of these – "the search for beauty. Mathematics is an art, and as such affords the pleasures which all the arts afford." In this erudite, entertaining college-level text, Morris Kline, Professor Emeritus of Mathematics at New York University, provides the liberal arts student with a detailed treatment of mathematics in a cultural and historical context. The book can also act as a self-study vehicle for advanced high school students and laymen. Professor Kline begins with an overview, tracing the development of mathematics to the ancient Greeks, and following its evolution through the Middle Ages and the Renaissance to the present day. Subsequent chapters focus on specific subject areas, such as "Logic and Mathematics," "Number: The Fundamental Concept," "Parametric Equations and Curvilinear Motion," "The Differential Calculus," and "The Theory of Probability." Each of these sections offers a step-by-step explanation of concepts and then tests the student's understanding with exercises and problems. At the same time, these concepts are linked to pure and applied science, engineering, philosophy, the social sciences or even the arts. In one section, Professor Kline discusses non-Euclidean geometry, ranking it with evolution as one of the "two concepts which have most profoundly revolutionized our intellectual development since the nineteenth century." His lucid treatment of this difficult subject starts in the 1800s with the pioneering work of Gauss, Lobachevsky, Bolyai and Riemann, and moves forward to the theory of relativity, explaining the mathematical, scientific and philosophical aspects of this pivotal breakthrough. Mathematics for the Nonmathematician exemplifies Morris Kline's rare ability to simplify complex subjects for the nonspecialist.

Book Information

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Customer Reviews

This is the classic text (available in Dover hardbound and paperback editions) for a college course on mathematics for those who are not science majors and probably hated math in high school. Making math interesting for such a group is a tall order, but one that Professor Kline fills admirably. This book is well written, quite informative and a great choice for the target audience and for many who are much more well versed in mathematics. The book starts with numbers and goes through Euclidian geometry, algebra, calculus, statistics, probability theory and some topics in non-Euclidian geometry and advanced algebra. All this is all done from the prospective of the historical development of mathematics and why it is useful to everyone. This is all done in somewhat simplified manner and in a non-condescending tone. I found that this approach enriched my understanding of many mathematical concepts. For instance, I had previously learned the general solution for a quadratic equation as just a formula to be memorized. Professor Kline derives it. He does this by first solving quadratic equations by factoring them. He then shows how an equation that cannot be factored can be solved by a transformation of variables and that the general solution to the quadratic equation is nothing more than a generalized form of this latter approach. In school I learned about the ellipse and parabola from the standpoint of Cartesian geometry. This book first introduces these curves from the standpoint of how they would be drawn with string and a straight edge. This approach eliminates algebraic notation and I think more clearly shows the nature of these curves. There are many other gems in this book.

A spectrum exists in the books written by or about mathematicians and mathematics, and this spectrum is heavily weighted at the extremes. At one end, we have books purely verbal, descriptive and, more often than not, hagiographic in their descriptions of great mathematicians and their discoveries. - I suppose one could denominate these as mathematics groupie books. At the other end of the spectrum, we have straightforward mathematics textbooks, rather dry and boring, which roll off the presses with the regularity of the academic terms. To split the difference, to write a literate, narrative book on mathematics, is to attempt something akin to the labours of Hercules and, in the end, impossible to do perfectly, rather like trisecting an angle. Kline, however, does a bang-up

job here, and approaches the limit - so to speak - of what is possible. Good show, Morris! But, as many other reviewers have made clear, this book should have printed across its cover the words above the entrance to Plato's Academy: "Let no man ignorant of mathematics enter here." It is a bit of a catch-22 for someone who wants to learn mathematics but is put off by textbooks; you really have to already possess a fluency in the mathematical tongue, to possess a flair for the subject, in order to appreciate the sweep of this really quite grand book. Some pages of the book are simply equation followed by equation leading to a satisfying simplification or representing a derivation. If you can't follow these steps - sometimes quite involved - then you simply won't arrive at the "Aha!" moments which are the chief delight of this book. To quote Kline, "In his wisdom, Thales perceived what we shall perceive as we follow the story of mathematics, that the obvious is far more suspect than the abstruse.

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