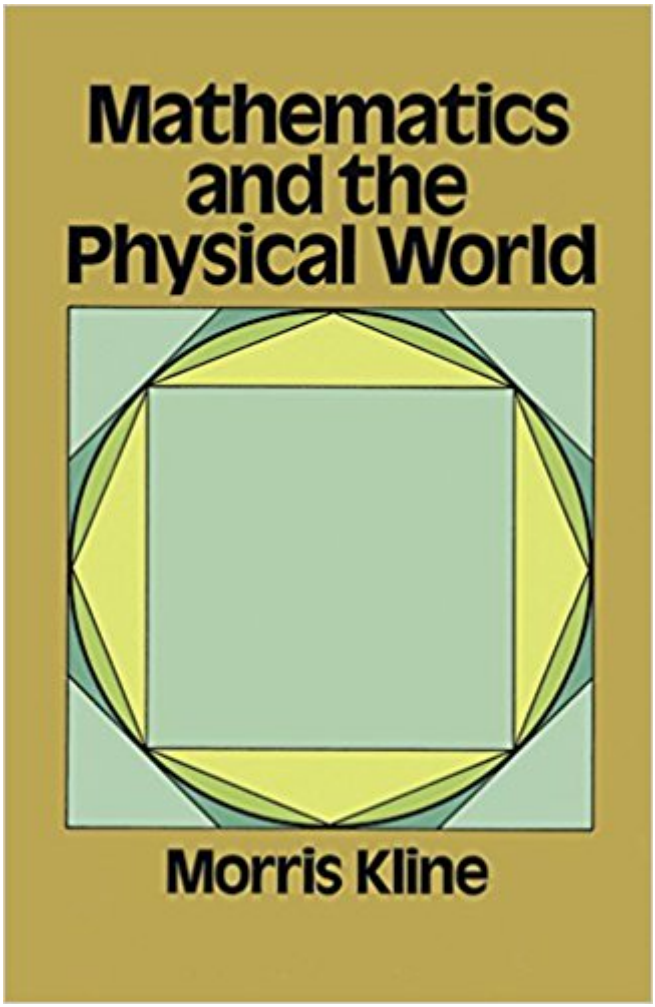
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Mathematics And The Physical World (Dover Books On Mathematics)



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Synopsis

"Kline is a first-class teacher and an able writer. . . . This is an enlarging and a brilliant book." Ã¢â ¬â ¢ Scientific American"Dr. Morris Kline has succeeded brilliantly in explaining the nature of much that is basic in math, and how it is used in science." Ã¢â ¬â ¢ San Francisco ChronicleSince the major branches of mathematics grew and expanded in conjunction with science, the most effective way to appreciate and understand mathematics is in terms of the study of nature. Unfortunately, the relationship of mathematics to the study of nature is neglected in dry, technique-oriented textbooks, and it has remained for Professor Morris Kline to describe the simultaneous growth of mathematics and the physical sciences in this remarkable book.In a manner that reflects both erudition and enthusiasm, the author provides a stimulating account of the development of basic mathematics from arithmetic, algebra, geometry, and trigonometry, to calculus, differential equations, and the non-Euclidean geometries. At the same time, Dr. Kline shows how mathematics is used in optics, astronomy, motion under the law of gravitation, acoustics, electromagnetism, and other phenomena. Historical and biographical materials are also included, while mathematical notation has been kept to a minimum.This is an excellent presentation of mathematical ideas from the time of the Greeks to the modern era. It will be of great interest to the mathematically inclined high school and college student, as well as to any reader who wants to understand Ã¢â ¬â ¢ perhaps for the first time Ã¢â ¬â ¢ the true greatness of mathematical achievements.

Book Information

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Customer Reviews

Sure, the examples can be dated (like an $1,800 annual salary being good, and a planet with a 2 Billion population), but NO other old or current text explains math as clearly. The teaching methods are timeless and unique.Simple example. We've all seen dozens of ways to explain the first derivative (the rate of change) of say x^2 as 2x. These range from slope finding to falling objects to matrices. But nearly all I've seen assume a curve, tangents, etc. Kline blows the mind with a rarely seen example-- a circle!He simply "animates" the circle and asks you to mentally extend the radius as it turns in the area-clock like the minute hand, only the size of the circumference. He then points out that the first derivative, the rate of change, is like extending the radius a bit, which "sweeps" out a larger circumference. Then he points out that y' in that case changes (pi)r^2 to 2(pi)r, instantly connecting radius, area and circumference in motion!This may seem trivial until we remember that Feynman used the same clock face example to explain quantum mechanics verbally, which blew the math community away at the time. In fact, connecting Kline's example with Feynman's gives some really interesting "aha" moments of new understanding.The whole book is like this, with many fun stories of how math reflects the natural world. You'll be amazed at the level of math he gets into with such simple assumptions as "very little math knowledge" before beginning. I mean, ALL applied math texts assume a LOT of math to begin. This is truly a rare gem, and a find for any High School STEM teacher wanting a real bridge to advanced concepts. Highly recommended, even in 2013 plus...

I studied Chemical Engineering as an undergraduate and got to see more than my fair share of mathematics during that time. I got through the program, but there were a lot of fragmented mathematical concepts in my mind. Ten years after graduation I'm finding an interest in revisiting old math textbooks and this book has been a godsend. For me, it shows how the various fields of math fit together. There are just enough anecdotes to make the overall concepts memorable. Morris is a great writer and it feels like he is on your team as he explains the concepts. I started tutoring my 10 year old nephew and I'm taking lessons from this book to make sure he has a sound foundation for more advanced concepts later on. I absolutely loved this book and would recommend it highly.

You can pay a lot of money for a book that doesn't cover the subject as well as Kline's. The heart of the book is its presentation of the historical scientific contexts of mathematical developments. The math is at the high school level and clearly presented. Kline's writing is not flashy; it is simple and lucid, great qualities for a book like this.

I graduated in physics several years ago. It happens in life that you first do things and later you understand what you have done. With this book it happened to me to understand most of what I have studied after I have read it. It was a turning point in my life and in my career too. This doesn't mean it will be the same for everybody but surely that was my experience. Since I have read it, I have never forgot the following paragraph.When earth was put apartGranted that it was the superior mathematics of the new theory which inspired Copernicus and Kepler, and later Galileo, to repudiate religious convictions, scientific arguments, common sense, and well-entrenched habits of thought, how did the theory help to shape modern times?First, Copernican theory has done more to determine the content of modern science than is generally recognized. The most powerful and most useful single law of science is Newton's law of gravitation. Without anticipating here the discussion reserved for a more appropriate place in this book we can say that the best experimental evidence for this law, the evidence which established it, depends entirely on the heliocentric theory.Second, this theory is responsible for a new trend in science and human thought, barely perceptible, at the time but all-important today. Since our eyes do not see, nor our bodies feel, the rotation and revolution of the Earth, the new theory rejected the evidence of the senses- Things were not what they seemed to be. Sense data could be misleading and reason was the reliable guide. Copernicus and Kepler thereby set the precedent that guides modern science, namely, that reason and mathematics are more important in understanding and interpreting the universe than the evidence of the senses. Vast portions of electrical and atomic theory and the whole theory of relativity would never have been conceived if scientists had not come to accept the reliance upon reason first exemplified by Copernican theory. In this very significant sense Copernicus and Kepler began the Age of Reason, in addition to fulfilling the cardinal function of scientists and mathematicians, that is, to provide a rational comprehension of the universe.By deflating the stock of Homo sapiens, Copernican theory reopened questions that the guardians of Western civilization had been answering dogmatically upon the basis of Christian theology. Once there had been only one answer; now there are ten or twenty to such basic questions as: Why does man desire to live and for what purpose? Why should he be moral and principled? Why seek to preserve the race? It is one thing for man to answer such questions in the belief that he is the child and ward of a generous, powerful and provident God. It is another to answer them knowing that he is a speck of dust in a cyclone.Mathematics in Western culture, Morris Kline, 1953

I highly recommend both Mathematics and the Physical World" as well as "Calculus: An Intuitive

and Physical Approach" both of which were authored long ago by Morris Kline. If you are looking for a refresher or an aid for a current class, Kline's books will prove highly valuable. The only way I was able to read both of these books is through the efforts of Dover, who has been reissuing out of print science and math books for many years. I was very happy to see that Dover is making at least some of these available in Kindle format.

A beautiful explication of the grandeur of mathematics! I know that is somewhat hyperbolic, but I never appreciated the depth of the field of mathematics before reading this book. I cannot recommend highly enough!

Excellent work. Very enjoyable read. Exellent for those studying history of math and science. Poor execution of port from print to digital: frequent errors that appear to be generated by an OCR scan that wasn't thoroughly proofed, which probably won't trip up math veterans. I'm about 30% through with it and will update this review if warranted.

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