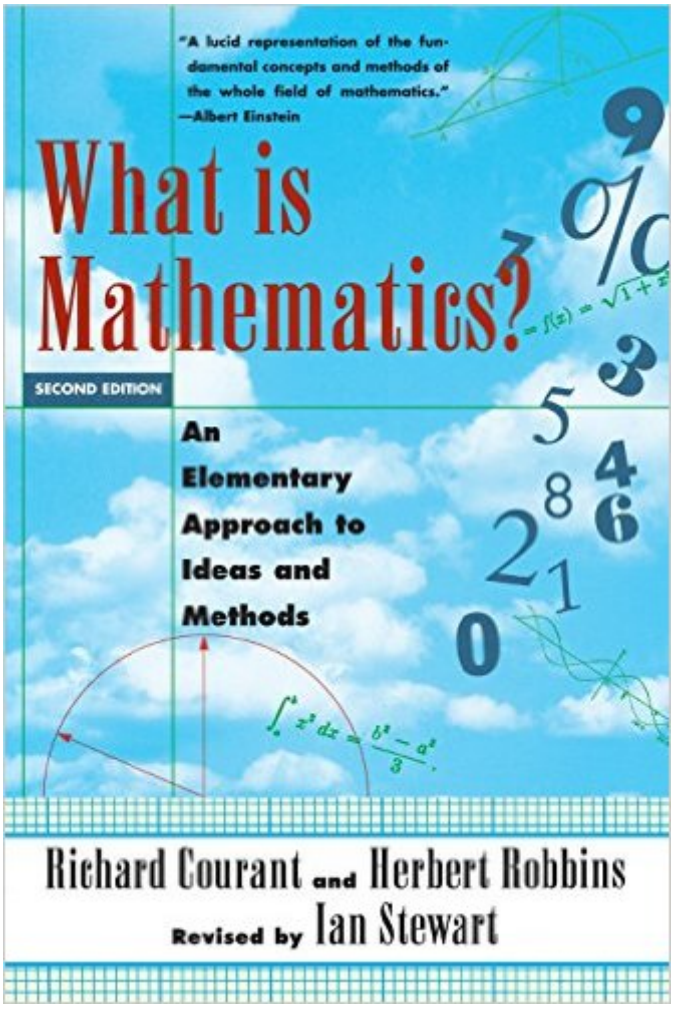
# What Is Mathematics? An Elementary Approach To Ideas And Methods



## Synopsis

For more than two thousand years a familiarity with mathematics has been regarded as an indispensable part of the intellectual equipment of every cultured person. Today, unfortunately, the traditional place of mathematics in education is in grave danger. The teaching and learning of mathematics has degenerated into the realm of rote memorization, the outcome of which leads to satisfactory formal ability but does not lead to real understanding or to greater intellectual independence. This new edition of Richard Courant's and Herbert Robbins's classic work seeks to address this problem. Its goal is to put the meaning back into mathematics. Written for beginners and scholars, for students and teachers, for philosophers and engineers, What is Mathematics?, Second Edition is a sparkling collection of mathematical gems that offers an entertaining and accessible portrait of the mathematical world. Covering everything from natural numbers and the number system to geometrical constructions and projective geometry, from topology and calculus to matters of principle and the Continuum Hypothesis, this fascinating survey allows readers to delve into mathematics as an organic whole rather than an empty drill in problem solving. With chapters largely independent of one another and sections that lead upward from basic to more advanced discussions, readers can easily pick and choose areas of particular interest without impairing their understanding of subsequent parts. Brought up to date with a new chapter by Ian Stewart, What is Mathematics?, Second Edition offers new insights into recent mathematical developments and describes proofs of the Four-Color Theorem and Fermat's Last Theorem, problems that were still open when Courant and Robbins wrote this masterpiece, but ones that have since been solved.Formal mathematics is like spelling and grammar--a matter of the correct application of local rules. Meaningful mathematics is like journalism--it tells an interesting story. But unlike some journalism, the story has to be true. The best mathematics is like literature--it brings a story to life before your eyes and involves you in it, intellectually and emotionally. What is Mathematics is like a fine piece of literature--it opens a window onto the world of mathematics for anyone interested to view.

## Book Information

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## Customer Reviews

Courant’s 500-page text is not entirely suitable for the layman. Its target audience includes those who enjoy reading and studying mathematics and have a good background through precalculus or higher. "What is Mathematics?" is a mathematics book, not a book about mathematics."What is Mathematics?" is not a new book. It was first published by Oxford University Press in 1941 with later editions in 1943, 1945, and 1947. Good quality soft cover copies are still in print as Oxford Paperbacks.The authors indicate that it is no means necessary to "plow through it page by page, chapter by chapter". I fully agree. I have skipped around, jumping to chapters of particular interest, but I have now read nearly every chapter.I initially skipped to page 165 and delved directly into projective geometry (chapter IV), proceeded to topology (chapter V), and then jumped backwards to the beginning to explore the theory of numbers. After moving to geometry, I finally returned to the later chapters on functions and limits, maxima and minima, and the calculus.Courant engages the reader in discussions on mathematical concepts rather than focusing on applications and problem solving. "What is Mathematics?" is a great textbook for students that have completed a year or more of calculus and wish to pull all of their mathematical learning together before moving on to more advanced studies. I suspect that it would even be welcomed by students that have completed an undergraduate degree in mathematics.I cannot resist quoting Albert Einstein’s comment on What is Mathematics? - "A lucid representation of the fundamental concepts and methods of the whole field of mathematics...Easily understandable."Richard Courant was a highly respected mathematician.

I always liked math as a child and was quite talented, but I absolutely hated the way math was taught in school. For a long time I could always grasp the necessary concepts intuitively, and so I didn’t have to bother with the books we were supposed to be working with (my teachers were frustrated over my not doing any "exercises", but I got away with it since I aced the exams). But when it came to high school and a bit more demanding math (mainly calculus), I couldn’t do it all by pure intuition and since I couldn’t deal with the math textbooks, I fell behind. Eventually I developed an outright aversion for math, confusing my life-long love for the subject with my intense dislike of

how it was taught in school.I kept looking for a better way to learn math - I just knew there had to be one. University textbooks was often better structured, but they presumed a lot of skills that I didn't have yet. Far too many years later I randomly came upon this book, and in it I found everything I had been looking for all along, namely clear and concise discussions of mathematical concepts.In school, the focus was always on exercises, with no clear explanation of the concepts involved. In fact, discussion of mathematical concepts was clearly avoided, even when it would have seemed quite natural. The general idea seemed to be to get kids to use mathematical concepts more or less blindly, and thereby "learning" them without having to think about them. For me this was just utterly perverse and unspeakably frustrating. Being intensely interested in understanding things, but strongly averse to mindless repetition, more than anything I felt like I was being punished, expected to learn how to use math, but deviously kept from actually understanding what I was doing.

Approach

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