Elements of Mathematics: From Euclid to Gödel

By John Stillwell

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Elements of Mathematics takes readers on a fascinating tour that begins in elementary mathematics--but, as John Stillwell shows, this subject is not as elementary or straightforward as one might think. Not all topics that are part of today's elementary mathematics were always considered as such, and great mathematical advances and discoveries had to occur in order for certain subjects to become "elementary." Stillwell examines elementary mathematics from a distinctive twenty-first-century viewpoint and describes not only the beauty and scope of the discipline, but also its limits.

From Gaussian integers to propositional logic, Stillwell delves into arithmetic, computation, algebra, geometry, calculus, combinatorics, probability, and logic. He discusses how each area ties into more advanced topics to build mathematics as a whole. Through a rich collection of basic principles, vivid examples, and interesting problems, Stillwell demonstrates that elementary mathematics becomes advanced with the intervention of infinity. Infinity has been observed throughout mathematical history, but the recent development of "reverse mathematics" confirms that infinity is essential for proving well-known theorems, and helps to determine the nature, contours, and borders of elementary mathematics.

Elements of Mathematics gives readers, from high school students to professional mathematicians, the highlights of elementary mathematics and glimpses of the parts of math beyond its boundaries.

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Editorial Review

Review
"[Stillwell] writes clearly and engagingly. . . . [*Elements of Mathematics*] can appeal to various constituencies at different levels of mathematical sophistication."**--Mark Hunacek, *MAA Reviews***

"A great exploration of elementary mathematics, its limitations, how infinity complicates things, and how various branches of mathematics fit together."**--Antonio Cangiano, *Math-Blog***

"Stillwell is . . . One of the better current mathematical authors: he writes clearly and engagingly, and makes more of an effort than most to provide historical detail and a sense of how various mathematical ideas tie in with one another. . . . The features we have learned to expect from Stillwell (including, but not limited to, excellent writing) are present in [*Elements of Mathematics*] as well."**--*MAA Reviews***

"An accessible read. . . . Stillwell breaks down the basics, providing both historical and practical perspectives from arithmetic to infinity."**--Gemma Tarlach, *Discover***

"[A] sophisticated treatment of topics usually described as elementary."**--John Allen Paulos**

"[*Elements of Mathematics*] is quite a tour de force, organized by areas of mathematics--arithmetic, computation, algebra, geometry, calculus, and so on--and in each area Stillwell manages to distill down the big ideas and the connections with other areas. He is a master expositor, and the text manages to be engaging and accessible without watering down the mathematics. I definitely learned new things from the book!"**--Brent Yorgey, *Math Less Traveled* blog**

"From a lifetime of teaching, Stillwell has distilled some nice examples from the entire gamut of elementary mathematics."**--*Mathematical Reviews Clippings***

"[A] wonderful book. . . . I think that [*Elements of Mathematics*] will itself become a modern classic and a reference work for anyone trying to learn basic topics in any of the major fields of mathematics."**--Victor Katz, *Bulletin of the American Mathematical Society***

"*Elements of Mathematics*is a fine . . . overview of the field of mathematics. . . . The writing is clear, succinct, organized, and the diagrams [and] illustrations excellent. . . . While some of the discussion is introductory or elementary, it always leads to deeper, more challenging ideas. . . . [T]his will make a fine basic addition to most mathematicians' bookshelves."**--*Math Tango***

"Stillwell uses his broad and impressive command of mathematics to transport a reader through each topic and to a higher level of understanding and questioning."**--*Convergence***

From the Back Cover

"The coherence of mathematics is on display in this masterful, beautifully written synthesis. With probing questions, lucid explanations, and fascinating examples and stories, John Stillwell reveals where the seemingly separate branches of math came from, how they intertwine, and why the hidden unifier is the deepest idea of all: infinity."**--Steven Strogatz, Cornell University and author of *The Joy of x***

"This is a beautifully written overview and excursion through elementary mathematics, written to appeal to nonspecialists. The book is distinguished by its breadth of scope and precise details. It will be a classic in the field."**--David Bressoud, Macalester College**

About the Author
John Stillwell is professor of mathematics at the University of San Francisco. His many books include *Mathematics and Its History* and *Roads to Infinity*.

Users Review

From reader reviews:

Lela Hird:

The feeling that you get from Elements of Mathematics: From Euclid to Gödel could be the more deep you digging the information that hide inside words the more you get serious about reading it. It does not mean that this book is hard to know but Elements of Mathematics: From Euclid to Gödel giving you enjoyment feeling of reading. The copy writer conveys their point in specific way that can be understood through anyone who read this because the author of this book is well-known enough. This kind of book also makes your own vocabulary increase well. So it is easy to understand then can go along, both in printed or e-book style are available. We propose you for having this kind of Elements of Mathematics: From Euclid to Gödel instantly.

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