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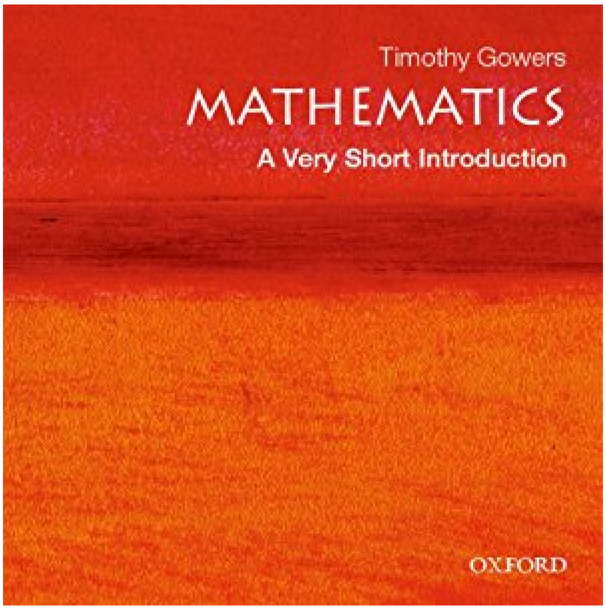
Mathematics: A Very Short Introduction



Synopsis

The aim of this audiobook is to explain, carefully but not technically, the differences between advanced, research-level mathematics, and the sort of mathematics we learn at school. The most fundamental differences are philosophical, and listeners of this audiobook will emerge with a clearer understanding of paradoxical-sounding concepts such as infinity, curved space, and imaginary numbers. The first few chapters are about general aspects of mathematical thought. These are followed by discussions of more specific topics, and the book closes with a chapter answering common sociological questions about the mathematical community (such as "Is it true that mathematicians burn out at the age of 25?").

Book Information

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Customer Reviews

Like many mathematicians, I often wish that I could give my non-mathematical acquaintances a better idea of what I actually do, and I was hoping that this book would serve that purpose. However, this book isn’t so much about what mathematicians do and why, but rather about what mathematics is, i.e. what certain basic mathematical concepts mean. The first 7 chapters roughly cover the following topics:1) What does it mean to use mathematics to model the real world?2) What are numbers, and in what sense do they exist (especially "imaginary" numbers)?3) What is a mathematical proof?4) What do infinite decimals mean, and why is this subtle?5) What does it mean to discuss high-dimensional (e.g. 26-dimensional) space?6) What’s the deal with non-Euclidean geometry?7) How can mathematics address questions that cannot be answered exactly, but only approximately?The eight and final chapter makes a few remarks about mathematicians.The writing is spare and beautiful. For each topic, the book takes just enough space to give the reader some food for thought, then moves on. I especially liked the middle four chapters. I would definitely recommend this book to students in lower-division undergraduate math courses who are curious about or puzzled by the above questions.The book touches on some philosophical questions. In doing so, the book flies close to some subtleties (such as Godel's theorem and the Banach-Tarski paradox) without acknowledging them (which is reasonable enough for a Very Short Introduction). Also, one can argue with some of the philosophical statements. For example, is mathematics discovered or invented?

Philosophy of math under 200 pages!If one expects a thorough course in basic math, this book may not be it - "Mathematics for the Million" by Lancelot Thomas Hogben should be your first choice. Nor does this book have much to say about the historical development of mathematics - for this there is no substitute for Morris Kline's "Mathematics for the Non-Mathematician" (which teaches the basic concepts of math simultaneously, aided by exercises).This book aims to convey, I think, a sense of what mathematical reasoning is like. "If this book can be said to have a message, it is that one should learn to think abstractly, because by doing so many philosophical difficulties simply disappear," writes Gowers in the Preface. And at times it does feel as though you're reading a book written by a philosopher. For instance, p. 80-81 discusses "What is the point of higher-dimensional geometry?" (Of course Gowers is not a philosopher but a VERY distinguished mathematician.)Incidentally, here's something that stumps me. Gowers says "[t]here may not be any high-dimensional [i.e., more than three] space lurking in the universe, but...." But I thought higher-dimensional space is what superstring theory is all about. And besides, Martin Rees, Andrei Linde and Alan Guth are now telling us there is an infinite number of universes outside our own, each taking a different number of dimensions - some fewer than three, others many more! Higher-dimensional space may not be as abstract as Gowers thinks.Gowers's main point, however, is that higher dimensions have meaning and validity in mathematics quite independent of whether they are grounded in objective physical reality, or whether physicists use them or not.

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