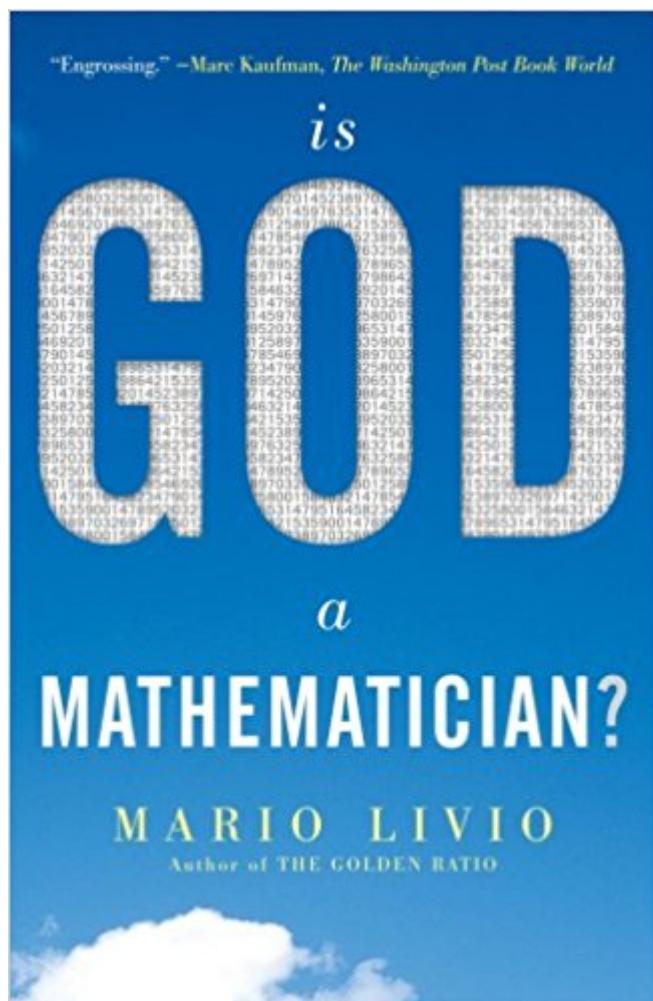


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# Is God A Mathematician?



## Synopsis

Bestselling author and astrophysicist Mario Livio examines the lives and theories of history's greatest mathematicians to ask how if mathematics is an abstract construction of the human mind it can so perfectly explain the physical world. Nobel Laureate Eugene Wigner once wondered about "the unreasonable effectiveness of mathematics" in the formulation of the laws of nature. > investigates why mathematics is as powerful as it is. From ancient times to the present, scientists and philosophers have marveled at how such a seemingly abstract discipline could so perfectly explain the natural world. More than that mathematics has often made predictions, for example, about subatomic particles or cosmic phenomena that were unknown at the time, but later were proven to be true. Is mathematics ultimately invented or discovered? If, as Einstein insisted, mathematics is "a product of human thought that is independent of experience," how can it so accurately describe and even predict the world around us? Physicist and author Mario Livio brilliantly explores mathematical ideas from Pythagoras to the present day as he shows us how intriguing questions and ingenious answers have led to ever deeper insights into our world. This fascinating book will interest anyone curious about the human mind, the scientific world, and the relationship between them.

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## Customer Reviews

The title of astrophysicist Livio's latest wide-ranging science survey is a teaser since God rarely makes an appearance; along with the French astronomer Laplace, Livio has no need of that hypothesis. Rather, Livio (The Golden Ratio) is concerned with the contentious question: is

mathematics a human invention? Or is it the intricate design of the universe that we are slowly discovering? Scientists in past centuries have argued for the latter, Platonist position. In the last 50 years, however, many scientists, calling into question the whole idea of scientific discovery, maintain that we have invented mathematics. Livio gives as one example the famous golden ratio, which has fascinated Western mathematicians for millennia and was originally emphasized for its mystical symbolism. But Chinese mathematicians, not sharing that outlook, didn't discover it—or maybe they just didn't need to invent it. Livio hedges his bets, unsatisfyingly arguing that mathematics is partly discovered and partly invented. But Livio is a smooth writer. His fans will enjoy this book, and new ones may discover him. B&w illus. (Jan. 6) Copyright © Reed Business Information, a division of Reed Elsevier Inc. All rights reserved. --This text refers to the Audio CD edition.

**\*Starred Review\*** Four centuries after church inquisitors accused Galileo of dangerous skepticism, a modern astrophysicist hails the Italian scientist as the embodiment of bold faith: namely, faith that God himself inscribed the heavens in mathematics. Because mathematics now empowers research communities investigating everything from deep-space pulsars to genetic proteins, a secularized version of Galileo's credo now defines the new orthodoxy of science. But Livio recognizes a profound mystery inherent in the formulas his colleagues employ so sedulously: Why does the universe harmonize so well with numbers accessible to human minds? Probing this mystery, Livio traces the evolution of mathematical reasoning from the ritual symbolism of the ancient Pythagoreans to the multilayered analyses of twenty-first-century string theorists. In the impressive parade of intellectual explorers, we encounter Archimedes pondering geometrical figures at the very moment of his death, Descartes overthrowing all of medieval philosophy with one audacious thought, and Gödel quashing the ambitions of system-building logicians. This wide-ranging inquiry, however, ultimately highlights far more than personalities. A sharp conflict emerges between platonically minded philosophers who view mathematical breakthroughs as transcendent discoveries and psychologically inclined thinkers who interpret these breakthroughs as merely human inventions. Testing the tensions between these views, Livio delivers an exhilarating foray into the founding premises of mathematical science. --Bryce Christensen --This text refers to the Audio CD edition.

Livio has written a very detailed, interesting history of many of the great thinkers in mathematics, and by extension, physics. The accounts of Pythagorus, Archimedes, Galileo, Decartes, Newton

were familiar, but Livio added some quite interesting details. I especially enjoyed the histories of some less-famous thinkers such as the Bernoulli brothers, John Graunt, Halley, Pearson, George Boole, etc. The story of The overarching question that the book poses -- whether mathematics is an invention of man or an inherent characteristic of the design of our universe -- is not really necessary and sometimes is a distraction from the interesting historical account. Livio does a great job in explaining the conventional wisdom and state of human thought during the period of each new breakthrough, and so helps the reader understand the progression of understanding through the ages. I read the Kindle version, and was disappointed in the poor editing which left all of the equations incomplete (the operators +. -. =, etc. were missing from all equations) in Chapter 7 on Logicians. However, the book was easily comprehensible even with those editing errors.

This is a solid book that looks into the principles of math in an effort to glean information about how universe seems to be based on mathematics. It is not a creationist based book. In fact, the primary argument is if math is evidence towards a creator or not. The book lays out the evidence and lets the reader decide based on what we know about math and things we are researching right now that might change the rules of math on the universe. It is an interesting read and is focused primarily on math and not God. The fact that the work GOD is bigger than the Mathematician implies

Maybe. Or maybe not. One conclusion is certain from this book: the author does not really tackle this exact question as his main theme. His big question for the reader, rather, is: has mathematics been discovered, or has it been invented? His answer turns out to be, "yes." Sometimes he argues for the one idea, sometimes for the other, either way strongly. God, perhaps, has to rule on the case, but Mario Livio certainly does not propose this! The "Plato" approach he speaks about at length takes the "discovery" side of the debate. Oddly enough, to this reviewer the amount of time spent on Mr. Plato probably muddled the story line, rather than clarifying. Nevertheless, "Is God a Mathematician?" flowed smoothly and satisfyingly. When treating a topic like a history in mathematics, an author could take on a theme and pick among hundreds of personages to flesh out the theme. One has the feeling that Dr. Livio did just that. Fortunately, his book gets credit for being both interesting and informative, thus worth reading. He does a fine job spelling out some technical topics for the world of us amateur, non-doctoral people. Much of the book sets up more like an anthology. The bad part: harder for the reader to keep the chapter threads connected. The good part: if you do not like a particular personage's story, you can skip to the next. Something gets lost, of course, but it may have been partially lost anyway. For theists looking for a deity's ownership of

mathematics, the author's answer is not really there. For those without religious belief, the answer would not matter anyway. So, forget the title words and enjoy the book for its stories. You might also be able to figure out the "Plato" part in more detail than did this reviewer.

I'm a Mathematician from early years through university and some graduate level courses. I'd heard of this book and wanted to check it out as I always thought , Mathematics was the language of our universe." So far it's living up to expectations. Not overly technical in explanations of theories.

The title might mislead the naive. There is no "theology" in the book. The book addresses the question of whether mathematics is invented or discovered. Dr. Livio presents quotations supporting both opinions, and some ambiguous evidence and reasoning. The book is well written, and accessible to non-mathematicians. For me there were no surprises, and some of the most convincing arguments for the "discovery" side of the argument were left out. (e.g. Euler's formula:  $e^{ix}=\cos(x) + i\sin(x)$ , with its astounding special solution:  $e^{i\pi} - 1 = 0$ .) Plus, Livio doesn't seem to discriminate between the notation, which is obviously a human invention, and the underlying reality, which would be true if no human had ever lived. (e.g. The value of Pi remains the same whatever base it is expressed in.) So, I gave it four stars. It is a nice, but unchallenging read.

This book could have been much better. That because it promises what it doesn't deliver: an answer to the thorny problem of the strange effectiveness of math. The author builds up nicely from the history of the subject up to the last chapter where he is supposed to tackle the problem as promised. Yet he comes up with a and eclectic "solution" that is really an evasion or a cop out. Nonetheless, the book is well written and clarifies a lot of mathematical problems, other than the main one.

This a a fantastic book. The author takes you on a tour of the history of mathematics, from Pythagoras through Archimedes, Galileo, Newton and many others with an eye toward trying to answer the question: is math something humans invent or discover?. No subject is explored too deeply, mainly because the topics are so broad and far ranging, but they are covered with enough depth to give you a good understanding of the concepts involved. While this book won't answer all of your questions, it will give you a good base of knowledge as to what math really is.

This is a fascinating book that should appeal to mathematicians and non-mathematicians alike.

Unfortunately the mathematical typesetting in the Kindle version is awful. It can be deciphered by the mathematician but will undoubtedly confuse the lay reader. (Fortunately there are few mathematical expressions.) Recommend getting the hard copy version for a better experience.

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