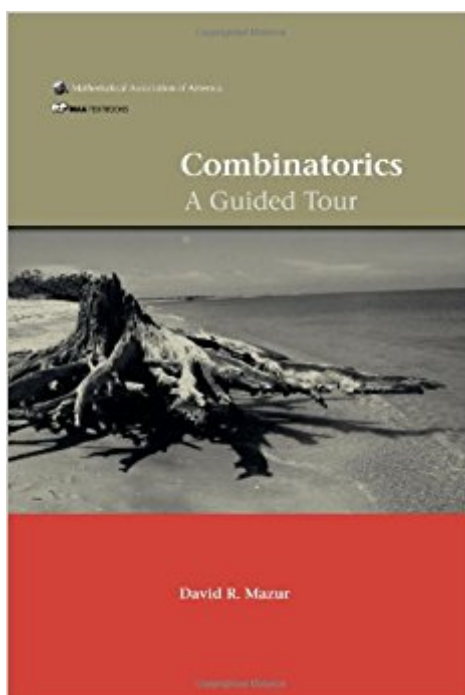


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# Combinatorics: A Guided Tour (MAA Textbooks)



## Synopsis

Combinatorics is mathematics of enumeration, existence, construction, and optimization questions concerning finite sets. This text focuses on the first three types of questions and covers basic counting and existence principles, distributions, generating functions, recurrence relations, PÃf&#x83;Ã &#x83;Ãf&#x82;Ã &#x83;Ãf&#x83;Ã &#x82;Ãf&#x82;Ã Â lya theory, combinatorial designs, error correcting codes, partially ordered sets, and selected applications to graph theory including the enumeration of trees, the chromatic polynomial, and introductory Ramsey theory. The only prerequisites are single-variable calculus and familiarity with sets and basic proof techniques. The text emphasizes the brands of thinking that are characteristic of combinatorics: bijective and combinatorial proofs, recursive analysis, and counting problem classification. It is flexible enough to be used for undergraduate courses in combinatorics, second courses in discrete mathematics, introductory graduate courses in applied mathematics programs, as well as for independent study or reading courses. What makes this text a guided tour are the approximately 350 reading questions spread throughout its eight chapters. These questions provide checkpoints for learning and prepare the reader for the end-of-section exercises of which there are over 470. Most sections conclude with Travel Notes that add color to the material of the section via anecdotes, open problems, suggestions for further reading, and biographical information about mathematicians involved in the discoveries.

## Book Information

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## Customer Reviews

This is a well-written, reader-friendly, and self-contained undergraduate course on combinatorics, focusing on enumeration. The book includes plenty of exercises, and about half of them come with hints. --M. Bona, Choice Magazine...Combinatorics is an excellent candidate for a special topics course for mathematics majors; with the broad spectrum of applications that course can simultaneously be an advanced and a capstone course. This book would be an excellent selection for the textbook of such a course. The explanations are at an appropriate level for the audience and there are exercises at the end of each section...The coverage is also sufficient of breadth; all of the major areas of combinatorics are covered...This book is the best candidate for a textbook in combinatorics that I have encountered. --Charles AshbacherI have reviewed many books on discrete mathematics over the years; some have been quite good...However, the book reviewed here, Combinatorics: A Guided Tour by David R. Mazur (hereafter CAGT) is the best book ever written on undergraduate combinatorial theory--it deserves an award. I like everything about this book, starting with the selection of topics and the organization....The delineation of the topics is first rate--better than I have ever seen in any other book. Their presentation is generally thorough, with much of it in the form of worked problems. The book is very much designed as a textbook; there are plenty of problems at the end of each section. ... CAGT has both good breadth and great presentation; it is in fact a new standard in presentation for combinatorics, essential as a resource for any instructor, including those teaching out of a different text. For the student: If you are just starting to build a library in combinatorics, this should be your first book. --The UMAP Journal

Combinatorics is the mathematics of counting. This text presents the topics covered in undergraduate courses in combinatorics and advanced discrete mathematics, as well as in some introductory graduate courses. Uniquely, it features over 350 reading questions that provide checkpoints for learning and prepare the reader for the end-of-section exercises.

This is one of the best math books I have read, and I've read quite a few. It's a great text book and a great book for self-learning as well. It doesn't assume too much about prior knowledge, and does a good job developing the tools and background needed to understand the concepts. The class I had did not use this book, but I got it from a friend who did use it in his class. By the end, I totally relied on this book as the other book wasn't that helpful. What stands out:- Painstaking effort to develop notations (like in inclusion/exclusion) that suggest what is going on logically.- Connecting a range of techniques together into an easily referenced area (e.g., counting techniques for distinguished/identical balls into distinguished/identical bins brought together in one table that was

sequentially filled out as the techniques were discussed).- Detailed pictures that are not just referenced but leveraged to great success when describing what is going on with a combinatorial counting technique.- Consistent references in the book to things where concepts were first introduced, and forward to where statements will be proven. The biggest criticism I have of math books is when they discuss a concept and spend an inordinate amount of time discussing things that are easy, but when it comes to the difficult nut of the new concepts, just blows through that part with very little exposition. This book does NOT make that mistake. The author has a good grasp of what the difficult parts of a new concept are and takes care to discuss those parts with care, anticipating hangups that the student might have with the concept and talking them through it. To make this not seem like a totally gushing review, I'll point out one style disagreement. The author has inline questions (well-set from the text) that he asks you to consider but does not answer in the text. The questions are usually pretty easy to think through, and the remainder of the text either doesn't depend on the student having the answer or, if it is needed, actually does provide the answer later. However, that can be distracting if you get hung on a question you can't answer. Overall, it doesn't detract from the book, and again, I'd say it's a style difference.

I am currently using this book for an introductory but upper division course in combinatorics. I really like it! And so do my students. In fact, I did not ask them what they thought of the book - they came and told me. Of late, my students resent buying ANY textbooks. They just cannot afford it. I thought this book was reasonably priced and so far I have not had any substantial complaints. A few students misunderstand the wording of some questions - but that is unavoidable with any book and group of students. I really like the topics, the presentation, and especially the many worked examples. There is a more than adequate selection of homework problems, too. There is a good mixture of easier and harder homework problems. Overall just a great book.

A concise introduction to a variety of subjects in combinatorics. I used this for an upper-level undergraduate course on the subject. It explains the basic concepts in chapters 1-3 very well but some of the explanations in the later chapters are unclear and terse. Lots of good examples throughout though. Would recommend.

Very interesting

It is an assigned text for the course I'm taking. This meets my needs and expectations. A Clear

introduction to the topic.

Good

Perfect

This book would be much better if it included at least all of the answers to the odd problems. But it doesn't, and many of the "solutions" it does provide are not solutions, just hints, which doesn't tell me if I did my work correctly. Although it does have answers to select even problems. It can be extremely frustrating as a student when trying to learn the material and not know if you are doing practice problems correctly. I'm not sure if it is the subject or the book, but it is very proofy at times, making the material much more difficult than it needs to be. On top of that there is no solutions manual to the book for extra help. The book does provide some good examples that help in areas where the book is lacking. I haven't had experience with other combinatorics books so I can't say how helpful it is in comparison, but out of the other math books I have used, it has been the least helpful.

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