



## Combinatorics: A Guided Tour (MAA Textbooks)

By David R. Mazur

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**Combinatorics: A Guided Tour (MAA Textbooks)** By David R. Mazur

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,  $P$ - $A$  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.

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### Editorial Review

#### Review

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 Ashbacher

I 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

#### About the Author

David Mazur is Associate Professor of Mathematics at Western New England College in Springfield, Massachusetts. He received his undergraduate degree in mathematics from the University of Delaware in 1993. He then began graduate study at The Johns Hopkins University where he earned a Master's in 1996 and a Ph.D. in 1999, focusing on operations research, integer programming, and polyhedral combinatorics. He was a 2000-2001 Project NExT fellow and continues to be active in the Mathematical Association of America.

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