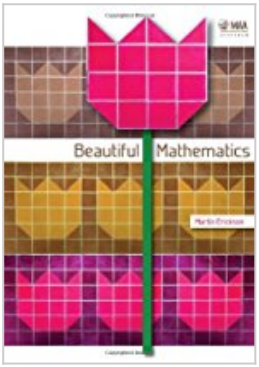

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Who should read this book? There is something new for any mathematically-minded person. High school and college students will find motivation for their mathematical studies. Professional mathematicians will find fresh examples of mathematical beauty to pass along to others. Within each chapter, the topics require progressively more prerequisite knowledge. An appendix gives background definitions and theorems, while another gives challenging exercises (with solutions).

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Editorial Review

Review
Beautiful Mathematics is a collection of interesting mathematical explorations published by the MAA. If you find the following questions (many of which are new to me) intriguing then you'll probably enjoy this book.

1. Do you know the dimension of Sirpienski's Triangle
2. Have you ever explored squaring maps?
3. What is the Riemann Sphere?
4. Can you find a formula that associates Fibonacci numbers and Pi?
5. Can a square be inscribed in any triangle?
6. What are the first three digits of the millionth Fibonacci number?
7. Do you know how to construct a regular heptagon using a straight edge, compass, and angle trisecting device?
8. Can you prove Lagrange's Theorem, that every positive integer is the sum of four squares?
9. How many triangles are there of perimeter n, where n is an integer, the sides are all integer lengths and the triangles are incongruent?

"Beautiful Mathematics" has nearly 100 challenging investigations, most with elegant solutions presented. Topics include words, images, formulas, theorems, proofs, solutions, and unsolved problems. --Sol Lederman, Wild About Math

There is probably no mathematician who has never been surprised by a mathematical statement or has not been delighted in a mathematical argument. For those who know, mathematics has beauty, elegance, mystery, and of course surprise. Most mathematicians chose this endeavor after having experienced such a moment of enlightenment. *Beautiful Mathematics* offers ample opportunity for such an experience to everyone with even a slightest interest in mathematics.

This book is a collection of short (1-2 pages long) vignettes that illuminate mathematical beauty from various angles. Mathematicians use imaginative words: lemniscate (a woolen ribbon used in fastening a garland to someone's head), waterfall of primes, golden ration, triangular numbers... They visualize intriguing images: binary trees, projective plane, two-colored graph, and come up with captivating formulas: series and products for n, the Riemann Zeta function, the Jacobi identity. Mathematicians prove delightful theorems: Morley's, Monge's, Minkowski's. Mathematics has pleasing proofs and elegan solutions; to pose an interesting problem requires creativity; all of that stands on harmonious foundations.

The book ends with eye-opening explorations and these come with solutions, to boot. If pressed for an extra rubric, I would consider a separate section on "Engaging Games," as this is something that mathematicians are preoccupied with--literally and metaphorically. (Not that the book entirely overlooks that side of mathematical activities. There are chapters on zero-sum games, nonattacking queens game, transversal achievement game--and more.) --Alex Bogomolny, MAA Reviews

It has become a cliche for mathematicians to describe their subject as 'beautiful.' Indeed it is probably the standard word used by enthusiasts when trying to convince others that mathematics is worth studying. The notion of beauty is of course a highly subjective one, but this book on 'beautiful mathematics' contains such a breadth of material that it would surely be possible for any reader to find something that appeals to them. As he indicates in his preface, the author's goal in writing this book was to 'inspire readers with the beauty of

mathematics'. In pursuing this aim, he presents an impressive cross-section of mathematics, covering many different topics, and spanning the centuries.

...This is not a book for the complete mathematical beginner: the concepts and symbolism of calculus are used, for example, but never explained. It is, however, a book that is likely to ensnare fully the reader who already has a burgeoning interest in mathematics. The author assumes a moderate, and by no means unreasonable, level of mathematical competence from his readers, and appears to have a great deal of confidence in them. At the same time, he gently guides them through ideas that he is presenting, without ever slipping into condescension.

It is difficult to convey in this review the sheer range of mathematics that the author manages to cover in this book, as he moves rapidly, and with little preamble, from one topic to the next. Moreover, the choice of subjects is by no means obvious. The favorites of popular mathematics writing are certainly represented (the golden ratio and Fibonacci numbers, for instance), but the book contains a wealth of other material that one wouldn't necessarily expect to find in a book written for a (reasonably) general audience.

The book is sprinkled with references to enable the interested reader to take certain topics further. The human dimension is hinted at in places, with the inclusion of brief historical comments. A minor gripe is that the author might also have incorporated a few historical references for the reader to pursue.

Naturally, this is not a book that should be read from cover to cover, but rather one to dip into. Nevertheless, when browsing through the book, there is a certain sense of development, something that is reinforced by the very useful internal referencing.

In conclusion, I agree wholeheartedly with the statement made by the author in his preface that 'there is something new in [this book] for any mathematically-minded person.' I certainly encountered many interesting ideas and theorems that were new to me, and I would recommend this book to anyone with a mathematical bent who wishes to broaden their knowledge of the subject. --Christopher Hollings, Mathematics Today

No mathematician needs to be told that there is a great deal of beauty in mathematics, although it is still nice to be reminded of it once in awhile. This book will do a great deal of that.

There is no underlying theme or area of emphasis, there is great breadth of coverage. One could justly call it mathematical ramblings. The only requirement is that the mathematics be elegant and relatively simple. Topics range from complex numbers, to the google and the Centillion, to hypercubes and taxicab numbers. Problems are posed that range from the simple to the currently unsolved, 31 problems referencing the topics appear in an appendix and solutions are included.

If you are a teacher of mathematics at the college level and are interested in presenting material that does not appear in the standard texts, then this is a book that you should look at. Most instructors of undergraduate classes should be able to find a problem suitable for inclusion in the class they are currently teaching. ---- Charles Ashbacher, Journal of Recreational Mathematics

About the Author
Martin Erickson was born in Detroit, MI in 1963. He graduated with High Honors from the University of Michigan in 1985 and received his Ph.D. at the University of Michigan in 1987. He is a professor of mathematics at Truman State University. He has written several acclaimed mathematics books, including *Aha! Solutions* (MAA) and *Introduction to Number Theory* (with Anthony Vazzana, CRC Press). He is a member of the Mathematical Association of America and the American Mathematical Society.

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