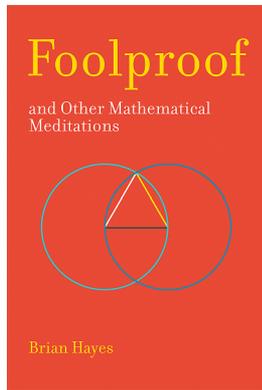




New and Noteworthy Titles on our Bookshelf August 2019



MIT Press, 2017, 248 pages.

Foolproof and Other Mathematical Meditations by Brian Hayes

This book is a collection of thirteen essays, each about fifteen pages or so, on a range of topics that includes enumerating Sudoku puzzle grids, self-avoiding random walks, the nature of mathematical proof, space-filling curves, and the numerical computation of π . The essays are composed with

relatively few equations or formulas, and the book includes plenty of gray-scale illustrations. It is accessible to anyone with an undergraduate mathematics degree.

Although the typical mathematician may have a passing familiarity with many of the subjects covered in the book, I suspect that most readers will find plenty of new material or, at least, new takes on old favorites. Moreover, it is not just the mathematics that is surveyed, but also the history and evolution of the topics. The first essay, “Young Gauss Sums It Up,” furnishes a perfect example. Most mathematicians are familiar with the anecdote about the harsh schoolmaster who assigned the young Gauss and his classmates the sum $1+2+\dots+100$. However, many of us will be surprised to learn that there are several distinct variants of this tale and that the modern version, familiar to us all, was the result of years of evolution. In this opening essay, Hayes goes back to the original sources, traces different renditions of the Gauss story throughout time, and includes several fascinating figures that indicate the frequency of various occurrences over the years.

The remaining topics are varied, although analysis, probability, and combinatorics feature most prominently. The book is self-contained but augmented with occasional bits of pseudocode with which the interested reader might verify Hayes’s calculations or explore on their own. Most

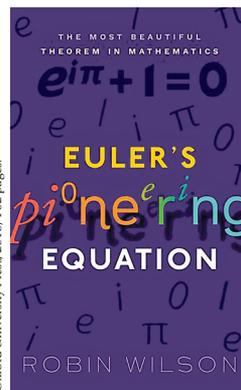
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of the essays contain a healthy dose of historical context and background. For example, Hayes’s discussion of Markov chains, a fairly standard topic in linear algebra and probability courses, spends a good deal of time recounting Markov’s use of the technique to study Russian poetry.

Overall, this book covers a wide range of material in a thought-provoking and inviting manner. It should satisfy a wide audience, and most mathematicians will have something to gain from it.



Oxford University Press, 2018, 162 pages.

Euler's Pioneering Equation: The Most Beautiful Theorem in Mathematics by Robin Wilson

Euler’s beautiful formula $e^{i\pi}+1=0$ unites in one elegant equation the five most important constants in mathematics. Each of the five numbers involved in this famous identity has its own unique history and peculiar properties. Wilson studies each constant in turn, paying careful

attention to the historical development of the mathematics and the notation behind it.

Although this book might be regarded as a “popular science” title, it understandably involves more mathematics than one usually sees at that level. For example, infinite series, integration, and complex numbers need to be reckoned with. There are lots of equations and diagrams, along with a fair number of pictures.

Most mathematicians will find this a quick and enjoyable read, while perhaps picking up a historical anecdote or cute result along the way. On the other hand, analysts, number theorists, and historians of mathematics might find little in this book that they do not already know. The ideal reader might be a curious student of calculus, who would find this book a fascinating invitation to pure mathematics.

Note: The author Robin Wilson is an emeritus faculty member at the Open University in the UK and should not be confused with the Robin Wilson who is on the faculty at California Polytechnic University and is on the editorial board of the Notices.