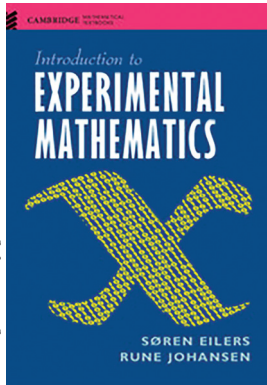




BOOKSHELF

New and Noteworthy Titles on our Bookshelf
December 2019



Cambridge, 2017, 316 pages

**Introduction to
Experimental Mathematics**
by Søren Eilers & Rune Johansen

Modern computers and special software readily permit mathematicians to formulate novel conjectures, study new examples, and, sometimes, prove results. *Introduction to Experimental Mathematics* claims to be the first textbook devoted to this experimental approach to mathematics,

which the authors describe as the use of computers for the “systematic investigation of concrete examples of a mathematical structure in the search for conjectures about its properties.”

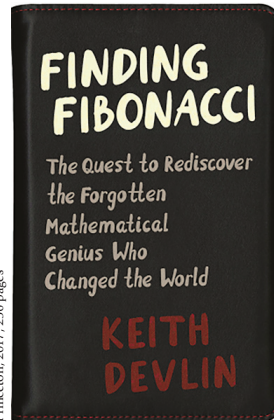
The book is aimed at beginning graduate students and advanced undergraduate students in mathematics. It provides enough material for a one-semester exploration of experimental mathematics designed to provide students the background and experience necessary to study and develop mathematical theory through experimental computation. The subject matter is largely drawn from elementary number theory, combinatorics, graph theory, linear algebra, and calculus, rendering the book suitable for a wide audience. *Introduction to Experimental Mathematics* contains fewer theorems and proofs than a traditional book. Instead it features copious examples and associated Maple code. Readers familiar with Maple will be able to hit the ground running; a chapter devoted to basic programming in Maple will help others get up to speed.

Each of this book’s eight chapters comes with many exercises. These are divided into three classes: “warmup,” “homework,” and “projects and group work.” Particularly difficult exercises are underlined; some of the underlined exercises in the third category are open problems.

The Bookshelf is prepared monthly by Notices Associate Editor Stephan Ramon Garcia.

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Princeton, 2017, 256 pages

Finding Fibonacci
*The Quest to Rediscover the Forgotten
Mathematical Genius Who Changed
the World*
by Keith Devlin

This book is an informal, first-person account of Devlin’s quest to learn about the influential mathematician and author Leonardo Pisano (Leonardo of Pisa), commonly known as Fibonacci. *Finding Fibonacci* is not a scholarly work of mathematical history, nor does it claim to be.

It is readable by anyone with a passing interest in mathematics or its history, or indeed by anyone who enjoys a pleasant tale of academic detective work.

Leonardo’s influential book *Liber Abbaci* (1202) popularized Hindu-Arabic numerals and basic problem-solving skills among the Italian commercial class (the Fibonacci sequence, as we now call it, appeared in an exercise about rabbits). Devlin makes a compelling argument that *Liber Abbaci* set the stage for the quantitative revolution that changed the commercial and scientific worlds in the following centuries.

Among the main focal points of Devlin’s account is his fateful 2001 encounter with an Italian historian of medieval mathematics. This conversation ignited Devlin’s long quest to read firsthand from extant early copies of Fibonacci’s *Liber Abbaci*. The author’s occasional misadventures in Italian libraries add some humor to the tale. Another seminal event in Devlin’s story is due to Laurence Sigler, the mathematics professor from Bucknell University who produced the first English translation of *Liber Abbaci*. The unusual circumstances under which the translation was produced and finally published are an intriguing tale that we shall not spoil here. One final theme concerns the findings of a Yale finance professor who, in 2004, published a paper based upon the *Liber Abbaci* translation that purports to show, as Devlin puts it, that “essentially all present-day financial instruments have early counterparts there.” Thus, Devlin argues that the modern financial world traces its roots back to Leonardo Pisano.