Review of the book

"Number Story: From Counting to Cryptography"

by Peter M. Higgins

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1 Summary of the review

Numbers are a fascinating and interesting subject, and what an interesting book Higgins has written about them! Mainly aimed at the non-technical reader, but also suitable for those more familiar with mathematics, the text is a grand overview of numbers and their history. Every chapter is filled with facts, anecdotes, examples and tricks that will keep the curiosity of the reader alive till the very last page.

2 What is this book about?

Among all the classical subjects that students are required to learn during their school studies, mathematics is probably the most hated. Considered difficult by many, it is often regarded as a mysterious field, governed by imperscrutable laws and mostly detached from real life. The number of college students enrolled in a maths major at universities worldwide is ever declining. Mathematics, however, continues to exert a form of fascination, as much and even more than other sciences. In popular culture, a mathematician is often awarded an almost magical power to easily solve otherwise impossible problems, as popular television series like *Numb3rs* (by Falacci and Heuton) show. This popularity has helped to attract many to this discipline and has contributed to spread a wide literature designed for the non-technical, uninitiated readers. Plenty of leisure books of varying quality are available today, virtually covering all the main fields of mathematics. The numbers, their history and the theories behind them are undeniably one of the most fascinating.

With his *Number Story: From Counting to Cryptography*, Peter Higgins, PhD, Professor of Mathematics at Essex University, UK, tries to reveal centuries of advances, successes and failures in the human relation with numbers, from the first counting attempts to the modern theories and applications explored today. The first chapters of the book are an overview of what numbers are, and what properties they have. It starts with number bases, and explains why we mostly use base 10, and continues showing things like divisibility tests, magical arrays, Catalan and Fibonacci sequences and prime numbers. Every page is filled with puzzles, tricks, anecdotes and interesting facts. Later in the book we learn about new number types, including the irrational and complex ones, and we discover infinite collections, and how they can be compared one to another. Two chapters are dedicated to the history of numbers and, therefore, of mathematics.

The book ends with a broad overview of cryptography, from the first historical ciphers to public key and modular arithmetic.

3 What is the book like?

Overall, Higgins' book tells a wonderful story, the Number Story. It does so in a conversational, slow-paced manner that gently carries the reader through even the most complex subjects, but manages to keep that *what's next?* feeling that only well-written novels have. His style is entertaining while accurate, a great example of how it is possible to rigorously write on mathematics without slowing down the text with countless equations. An occasional reader willing to concentrate a little will be able to walk through the text without any particular prior knowledge. The main concepts are explained so clearly and naturally that one is left to wonder why things looked difficult before. Those who are more familiar with mathematics will instead find plenty of interesting and challenging ideas, details, subtleties. The last chapter of the book, *For Connoisseurs*, is entirely dedicated to a more formal investigation of some of the claims found previously in the text. It is the only part of the book where the author makes free use of formulas and standard mathematical notation.

4 Would you recommend this book?

Being aimed to such a wide audience, the book has been designed so that it can be read on many different levels, and even in a non-sequential manner. It may be a great read for a last year high school student with a passion for mathematics, or anyone else in the general public with a similar interest. Readers with a better knowledge of the field will still find the book entertaining, but they will probably browse the book for the interesting bits and chapters, rather than read it from cover to cover. Overall, Number Story is a book you are more likely to find in the non-fiction shelves of your local book shop than in a university library, but it is a very good book indeed.

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