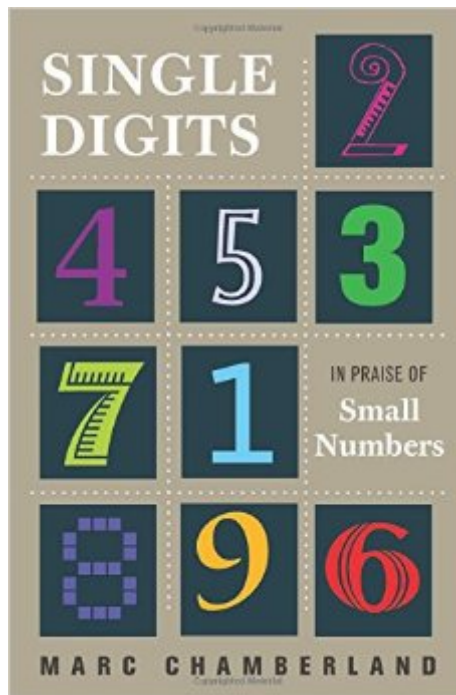


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# Single Digits: In Praise Of Small Numbers



## Synopsis

The numbers one through nine have remarkable mathematical properties and characteristics. For instance, why do eight perfect card shuffles leave a standard deck of cards unchanged? Are there really "six degrees of separation" between all pairs of people? And how can any map need only four colors to ensure that no regions of the same color touch? In *Single Digits*, Marc Chamberland takes readers on a fascinating exploration of small numbers, from one to nine, looking at their history, applications, and connections to various areas of mathematics, including number theory, geometry, chaos theory, numerical analysis, and mathematical physics. Each chapter focuses on a single digit, beginning with easy concepts that become more advanced as the chapter progresses.

Chamberland covers vast numerical territory, such as illustrating the ways that the number three connects to chaos theory, an unsolved problem involving Egyptian fractions, the number of guards needed to protect an art gallery, and problematic election results. He considers the role of the number seven in matrix multiplication, the Transylvania lottery, synchronizing signals, and hearing the shape of a drum. Throughout, he introduces readers to an array of puzzles, such as perfect squares, the four hats problem, Strassen multiplication, Catalan's conjecture, and so much more. The book's short sections can be read independently and digested in bite-sized chunks--especially good for learning about the Ham Sandwich Theorem and the Pizza Theorem. Appealing to high school and college students, professional mathematicians, and those mesmerized by patterns, this book shows that single digits offer a plethora of possibilities that readers can count on.

## Book Information

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## Customer Reviews

This book is a great idea but what appears here is a first draft. The book needs more meat to make it understandable. A visual proof of the Pythagorean Theorem is "presented" in Figure 2.4 but the explanation does not match the figure -- and figure and explanation are on the opposite sides of the same page, which you keep turning and turning, trying to figure things out. Here's a quote from The Twin Prime Conjecture: "...PrimeGrid announced the largest known twin primes: 3, 756,801,695 x 2,666,669 +/-1. These numbers have 200,700 decimal digits." That is simply senseless. Like so many places in this book, you read, you stop, you scratch your head, and you ask yourself, "What the heck does that really mean?" This book does not tell you.

Cool book. Full of fascinating tidbits from all branches of mathematics. Nine chapters on the numbers 1-9 naturally. No pun intended. Chapter 1 has 13 topics treated briefly, each illustrating the number one. His choices are interesting. Chapter one has a section on the Cantor middle third set. So what does this have to do with the number one? After an infinite number of increasingly smaller middle third intervals of a segment of length one are removed, the total length of all of the removed pieces is one, yet an uncountable set of numbers not removed (Cantor dust) remains on the interval. Lots of stuff I never saw before. A treasure trove for math teachers and mathophiles everywhere. Loved it.

Regular consumers of 'popular' math books will encounter a few chestnuts they've seen many times before (e.g., Erdos number), but there are enough mathematical curiosities in this book to justify taking a look. I picked up this book in the New Books section of my local library, and am planning to buy it. I only noticed one error: in Figure 3.1, the arrow should loop back to the "4" rather than the "2".

Grab a pencil and paper -- you'll need to take notes, but you'll enjoy working through many of the examples. Don't worry -- hardly any calculus. An absolute joy.

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