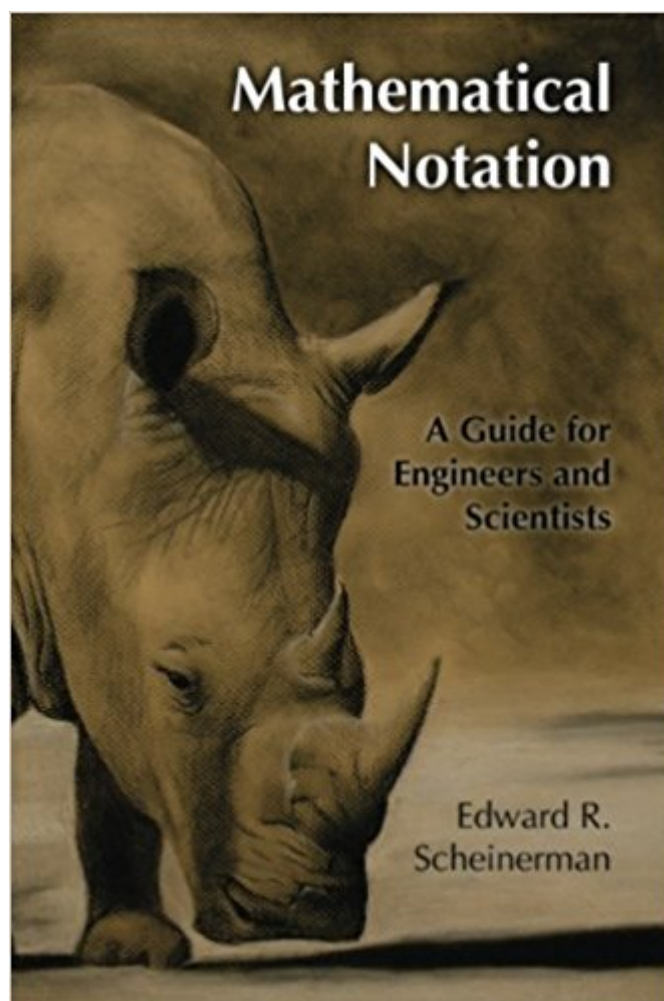


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# Mathematical Notation: A Guide For Engineers And Scientists



## Synopsis

Mathematics is a language with a unique vocabulary, written with a dizzying array of often incomprehensible symbols. If we are unsure of the meaning or usage of a mathematical word, a quick internet search is invaluable. But what are we to do when confronted with some strange mathematical hieroglyph? What does one type into the search bar? This book is the answer! Our goal is to cover mathematical notation commonly used by engineers and scientists---notation a university student is likely to encounter. We make no attempt to teach the mathematics behind these symbols. Rather, our goal is to give reminders of what these symbols mean; from there, we can consult textbooks or resources on the web. The book is organized by mathematical topic, but multiple indices steer the reader to each symbol's explanation. We also show how to produce the symbols in LaTeX and give guidance on their mathematical usage.

## Book Information

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## Customer Reviews

Edward Scheinerman is Vice Dean for Education at the Whiting School of Engineering of the Johns Hopkins University where he is Professor of Applied Mathematics & Statistics with a secondary appointment in Computer Science. Renowned for his clear writing, he has twice won the Mathematical Association of America's Lester R. Ford Award for outstanding mathematical exposition.

Highly recommended for anyone with a programming background who occasionally needs to dip into academic / mathematical articles. You can't really type mathematical symbols into a Google or Wikipedia search if you come across one that you don't recognize - this little book solves that

problem perfectly, and explains enough of the mathematics that you can often piece together an understanding of the subject without looking further. Great book.

A comprehensive lookup table for nearly all of mathematics. Must have for people who need to do math. I'm preparing myself for higher-level mathematics courses in university study and for future study of mathematics. In many math texts, it is assumed that the reader knows the notation, however I've never figured out where people learn all of this notation. This book includes a few tables by which the reader can look up the desired symbol and be directed toward a page in the book where the symbol is explained. Many thanks for purchasing this book. I may purchase multiple copies after I get a salary just to further show my appreciation.

Good book to have if you are writing tech stuff. I would welcome a more detailed and advanced version. Here are some pointers for anyone thinking of writing one.

1. Discuss pros and cons of common alternative systems. For example, notation for matrices, vectors, and scalars: there are a couple of systems used at different levels. In elementary books bold letters for vectors might make sense. For advanced work, the "Householder system": uppercase Latin for matrices, lowercase Latin for vectors, and lowercase Greek for scalars, is the way to go.
2. Discuss misunderstandings. For example, lately I have seen a couple of Computer books with something like "Big Oh of  $n$  squared" in them, or maybe " $Oh(n^2)$ ". This is a disaster. Big O is short for both Landau's Order symbol, and Knuth's Omicron symbol, and there is no way anyone should use "Oh" rather than "O". Oh is for "OMG", "Oh, Calcutta", etc.
3. Discuss lesser known symbols that ought to be widely used, such as
  - 3.1: Knuth's rising and falling powers. (Too hard to write here)
  - 3.2: For selecting  $k$  items from a population of  $n$  things,  $C(n,k)$  for combinations (No repeats, Order does not matter) and  $P(n,k)$  (No repeats, Order does matter) are standard (although usually written as  $nCk$  and  $nPk$ , with the  $n$  and  $k$  subscripts). These should be supplemented with  $S(n,k)$  for strings (repeats allowed, order matters) and  $R(n,k)$  for "r-combinations" (repeats allowed, order does not matter). This convention unifies the basic tools of combinatorics, and is a no brainer once you see it.

Clear writing and presentation style. Excellent reference. Good size for daily use.

Amazing reference. This book is on my desk at all times for when I need to go over more detailed books or academic papers and my terrible math study doesn't hold up. I would especially recommend this book for artists or creative coders who need to dip in to linear algebra from time to

time. That said, this is definitely a reference book; if you don't already understand the concepts, you'll find the going a little rough.

Great book. If you're looking just for a good reference to the notation, then this is perfect. I am an electrical and computer engineering university student. It even includes a section on big O notation.

First, this book is not an endless guide to all things math symbols and there are some limitations. Though it does provide a useful guide for students. One of the major limits of this book is that it is limited to math. So if you are reading an equation in your Calculus book and want to look up a symbol in this book you may not find it. Because it is a physics symbol. Like angular velocity (lower case omega) won't be found here, but it is covered in the book from a pure mathematical standpoint. Also this book does not cover every usage since math books were written. One minor thing I notice missing was epsilon defined for Calculus limits in this book. He does a great job with the standard greek usage for functions, like Euler totient and such. And he provides the same for constants that everyone should probably know. Also he does a great job of clarifying when multiple symbols are used for the same notation, and how to use them without mixing and matching. So there is some elements of style in this book. The index by Greek letter is not totally complete, since it does not include the numerical constants. (kind of odd). But it is very helpful that the book has an index by symbols, both greek and otherwise, and a topical index. The latex chart is a nice bonus. Overall for the novice student this is better than trying to search a website, and it is informational. For the advanced student, it might not be the book for you. All in all it is still worth the price.

Great book, especially if you like me and sometimes forget the meaning behind the numerous amount of engineering and mathematical symbols. I would highly recommend this book to any engineer or anyone studying mathematics.

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