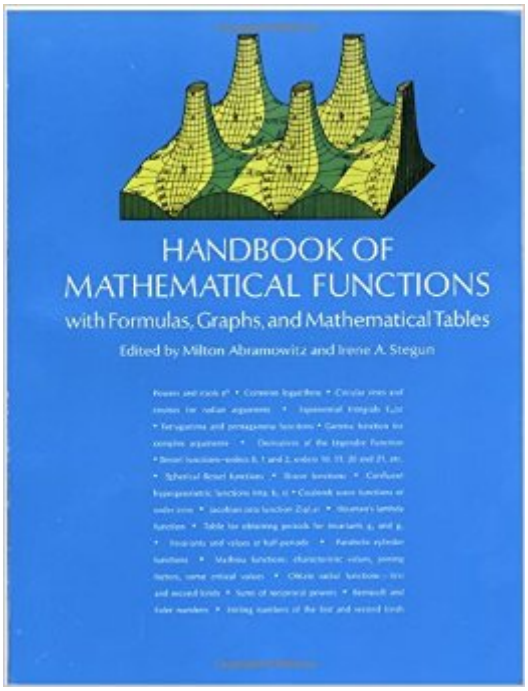
Handbook Of Mathematical Functions: With Formulas, Graphs, And Mathematical Tables (Dover Books On Mathematics)



Synopsis

Despite the increasing use of computers, the basic need for mathematical tables continues. Tables serve a vital role in preliminary surveys of problems before programming for machine operation, and they are indispensable to thousands of engineers and scientists without access to machines. Because of automatic computers, however, and because of recent scientific advances, a greater variety of functions and a higher accuracy of tabulation than have been available until now are required.In 1954, a conference on mathematical tables, sponsored by M.I.T. and the National Science Foundation, met to discuss a modernization and extension of Jahnke and Emde's classical tables of functions. This volume, published 10 years later by the U.S. Department of Commerce, is the result. Designed to include a maximum of information and to meet the needs of scientists in all fields, it is a monumental piece of work, a comprehensive and self-contained summary of the mathematical functions that arise in physical and engineering problems.The book contains 29 sets of tables, some to as high as 20 places: mathematical constants; physical constants and conversion factors (6 tables); exponential integral and related functions (7); error function and Fresnel integrals (12); Bessel functions of integer (12) and fractional (13) order; integrals of Bessel functions (2); Struve and related functions (2); confluent hypergeometric functions (2); Coulomb wave functions (2); hypergeometric functions; Jacobian elliptic and theta functions (2); elliptic integrals "> Handbook of Mathematical Functions: with Formulas, Graphs, and Mathematical Tables (Dover Books on Mathematics) $24.66 FREE Shipping on orders with at least $25 of books. Only 13 left in stock (more on the way). Ships from and sold by .com. Gift-wrap available.

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Customer Reviews

This book, originally published in 1964 by the National Bureau of Standards, is the result of a project started in 1954. It provides information on most of the functions then widely used in numerical computation in engineering and the physical sciences, including many formulas, and numerical tables of values for most of the functions.In 2001 it has two drawbacks. First, because algorithms for computing numerical values of mathematically functions have improved dramatically over the 37 years since this work was published, you will not find suitable algorithms for computing values of the various functions discussed. To write a program for a computer or programmable calculator to produce values of any of these functions, you should use algorithms obtained from more modern works.Second, and for much the same reason, you should not assume that all the numerical values given in all the tables are completely accurate; in 1964 calculations of some of these values with then-known algorithms pushed the state of the art to the limit. For example, in Table 7.3, "Complementary Error Function", two of the values attributed to a 1951 table by O. Emersleben are slightly incorrect in the last digit tabulated. This is not a criticism of this book, or of Emersleben; accurate calculation of values of the complementary error function for large arguments is tricky, and I have found similar errors in tables compiled more recently. However, good algorithms are now known, and should be used by anyone who desires reliable values.These days I find this book still useful for refreshing my memory on various of the many formulas it contains, but for numerical values I prefer to rely on more recent sources, or on programs that derive values using the better algorithms known these days.

I probably would never have gotten my PhD without this book, and it is a stupendous classic. Nowdays, though, my first resort is always Maple or Mathematica, with their manifold capabilities. I still find it useful for trying to understand what those programs are doing by way of simplification (or, more commonly, not doing). Eventually Maple and Mathematica will figure out that they need to couple a powerful explanatory capability to their marvelous algorithms, and this book will become truly obsolete - but that date is not yet here as of 2004.Four stars only because it has been partly overcome by history. 5 Plus for its historical importance.

A & S’s Handbook of Mathematical Functions is an absolute must have for any lover of mathematics. The explanations are top rate. With the abilities of computers to tabulate numbers

rapidly, the value of the tables is questionable. But the mathematical coverage is absolutely without equal. Any function you can think of, and some that you probably can't are covered in steamy, lurid detail. The paperback is such a great value that it makes me whinge to imagine that any lover of mathematics could possibly pass it by.

This book is a compendious of mathematical tables, formulas and graphics. It contains a very complete table of analytical integrals, differential equations and numerical series. Furthermore there are tables of trigonometric and hyperbolic functions, tables for numerical integration, rules for differentiation and integration and techniques for point interpolation and function approximation. There is a whole section for mathematical and physical constants as fractions and powers of Pi, e and prime numbers. Statistics are also discussed by presenting combinatorial analysis and probability functions. In its more than 1000 pages, almost all mathematical areas are treated. Every time you need same mathematical relation or information you will find it on this book. If you work with mathematical research or numerical computing you must have this book.

Certainly A&S is one of the very few books that have marked history for having become a standard reference text for functions. And with merit. I'd like to point out however the fact that there are certain drawbacks to its format: if You have to find out a specific property of a function You have to inspect every single bit of info You have at your disposal through the book; for example if You're looking for a property that is a particular case of a more general one You have first to identify the more general one, and this is certainly a difficult thing. Also another drawback is that functions with more than one parameter are not classified according to the value of the parameters themselves; You have to try to figure out the behaviour by yourself. Another bad thing is that not all the functions are graphed (example: Whittaker W and M). In any case, with its so large extent of covered topics, it is still the most valuable book of functions; for more specific or strange and particular subtopics or unusual properties You have to check the original texts where A&S took info from.

This book is a good overall summary of orthogonal functions. I did find it to be somewhat incomplete for prolate spheroidal wave functions, having to refer to the book from which they took their information. Overall, this book is a must-have for any physicist or mathematician. You can't beat the information per dollar density.

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