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Título: Complex Analysis

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Precio: \$1219.00

Editorial:

Año: 2013

Tema:

Edición: 1ª

Sinopsis

ISBN: 9783037191118

The theory of functions of a complex variable is a central theme in mathematical analysis that has links to several branches of mathematics. Understanding the basics of the theory is necessary for anyone interested in general mathematical training or for anyone who wants to use mathematics in applied sciences or technology.

The book presents the basic theory of analytic functions of a complex variable and their points of contact with other parts of mathematical analysis. This results in some new approaches to a number of topics when compared to the current literature on the subject.

Some issues covered are: a real version of the Cauchy-Goursat theorem, theorems of vector analysis with weak regularity assumptions, an approach to the concept of holomorphic functions of real variables, Green's formula with multiplicities, Cauchy's theorem for locally exact forms, a study in parallel of Poisson's equation and the inhomogeneous Cauchy-Riemann equations, the relationship between Green's function and conformal mapping, the connection between the solution of Poisson's equation and zeros of holomorphic functions, and the Whittaker-Shannon theorem of information theory.

The text can be used as a manual for complex variable courses of various levels and as a reference book. The only prerequisite is a working knowledge of the topology of the plane and the differential calculus for functions of several real variables. A detailed treatment of harmonic functions also makes the book useful as an introduction to potential theory.

A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Readership

Students and research mathematicians interested in complex analysis.

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