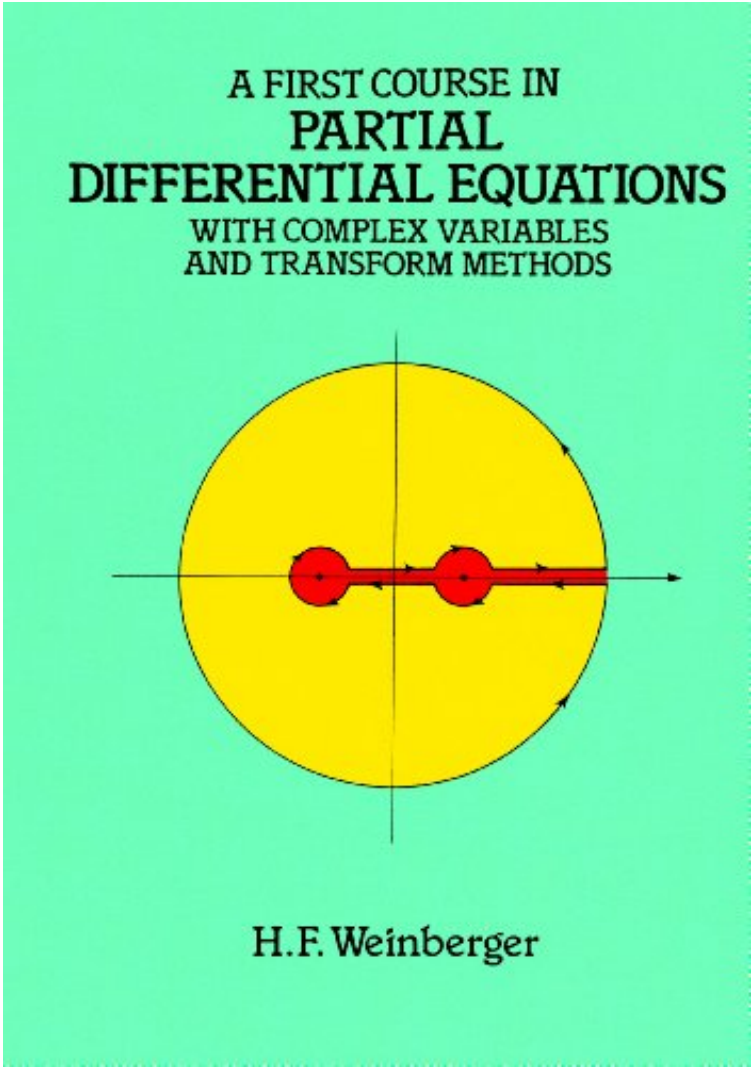
A First Course in Partial Differential Equations: with Complex Variables and Transform Methods



Par H. F. Weinberger
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Description :

Prsentation de l'diteurThis popular text was created for a one-year undergraduate course or beginning graduate course in partial differential equations, including the elementary theory of complex variables. It employs a framework in which the general properties of partial differential equations, such as characteristics, domains of independence, and maximum principles, can be clearly seen. The only prerequisite is a good course in calculus.Incorporating many of the techniques of applied mathematics, the book also contains most of the concepts of rigorous analysis usually found in a course in advanced calculus. These techniques and

concepts are presented in a setting where their need is clear and their application immediate. Chapters I through IV cover the one-dimensional wave equation, linear second-order partial differential equations in two variables, some properties of elliptic and parabolic equations and separation of variables, and Fourier series. Chapters V through VIII address nonhomogeneous problems, problems in higher dimensions and multiple Fourier series, Sturm-Liouville theory, and general Fourier expansions and analytic functions of a complex variable. The last four chapters are devoted to the evaluation of integrals by complex variable methods, solutions based on the Fourier and Laplace transforms, and numerical approximation methods. Numerous exercises are included throughout the text, with solutions at the back.