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Since its introduction in 1828, using Green's functions has become a fundamental mathematical technique for solving boundary value problems. Most treatments, however, focus on its theory and classical applications in physics rather than the practical means of finding Green's functions for applications in engineering and the sciences. Green's Functions with Applications systematically presents the various methods of deriving these useful functions. It leads readers through the process of developing Green's functions for ordinary and partial differential equations. In addition to exploring the classical problems involving the wave, heat, and Helmholtz equations, the book includes special sections on leaky modes, water waves, and absolute/convective instability. The author gives special attention to the numerical evaluation of Green's functions. By illustrating many of the functions in the text and problem sets, he helps readers develop an intuition about the behavior of Green's function in certain problems. He also considers the questions of the computational efficiency and possible methods for accelerating the process. With its wealth of examples and problems drawn from the literature, this book provides a treasure-trove of methods to construct and compute Green's functions. It is the most exhaustive source book of Green's functions yet available and the only one designed specifically for engineering and scientific applications.