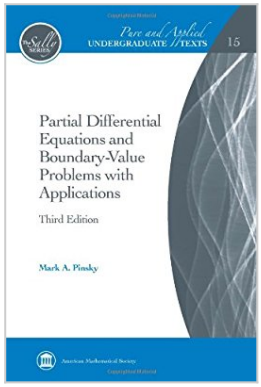

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By Mark A. Pinsky

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Building on the basic techniques of separation of variables and Fourier series, the book presents the solution of boundary-value problems for basic partial differential equations: the heat equation, wave equation, and Laplace equation, considered in various standard coordinate systems--rectangular, cylindrical, and spherical. Each of the equations is derived in the three-dimensional context; the solutions are organized according to the geometry of the coordinate system, which makes the mathematics especially transparent. Bessel and Legendre functions are studied and used whenever appropriate throughout the text. The notions of steady-state solution of closely related stationary solutions are developed for the heat equation; applications to the study of heat flow in the earth are presented. The problem of the vibrating string is studied in detail both in the Fourier transform setting and from the viewpoint of the explicit representation (d'Alembert formula). Additional chapters include the numerical analysis of solutions and the method of Green's functions for solutions of partial differential equations. The exposition also includes asymptotic methods (Laplace transform and stationary phase). With more than 200 working examples and 700 exercises (more than 450 with answers), the book is suitable for an undergraduate course in partial differential equations.

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Review
With more than 200 working examples and 700 exercises (more than 450 with answers) this book is suitable for an undergraduate course in PDEs. --Zentralblatt MATH

I have been one of the cheerleaders for Mark's book PDE and BVP over the years. . . . [M]ost texts for undergraduates are either too advanced or lacking mathematical rigor. Mark's book captures just the right balance. I found [it] easy to use and the problems were doable by my students. His latest edition added some rather important topics that were not covered earlier and emphasized points where the grind it out Fourier methods did not apply. --Marshall Slemrod, University of Wisconsin-Madison, Madison, WI

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