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Nota di contenuto	Beginning Partial Differential Equations; Contents; 1 First-Order Equations; 1.1 Notation and Terminology; 1.2 The Linear First-Order Equation; 1.3 The Significance of Characteristics; 1.4 The Quasi-Linear Equation; 2 Linear Second-Order Equations; 2.1 Classification; 2.2 The Hyperbolic Canonical Form; 2.3 The Parabolic Canonical Form; 2.4 The Elliptic Canonical Form; 2.5 Some Equations of Mathematical Physics; 2.6 The Second-Order Cauchy Problem; 2.7 Characteristics and the Cauchy Problem; 2.8 Characteristics as Carriers of Discontinuities; 3 Elements of Fourier Analysis 3.1 Why Fourier Series?3.2 The Fourier Series of a Function; 3.3 Convergence of Fourier Series; 3.4 Sine and Cosine Expansions; 3.5 The Fourier Integral; 3.6 The Fourier Transform; 3.7 Convolution; 3.8 Fourier Sine and Cosine Transforms; 4 The Wave Equation; 4.1 d'PAlembert Solution of the Cauchy Problem; 4.2 d'TAlembert's Solution as a Sum of Waves; 4.3 The Characteristic Triangle; 4.4 The Wave Equation on a Half-Line; 4.5 A Half-Line with Moving End; 4.6 A Nonhomogeneous Problem on the Real Line; 4.7 A General Problem on

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4.9 A Nonhomogeneous Problem on a Closed Interval4.10 The Cauchy Problem by Fourier Integral; 4.11 A Wave Equation in Two Space Dimensions; 4.12 The Kirchhoff-Poisson Solution; 4.13 Hadamard's Method of Descent; 5 The Heat Equation; 5.1 The Cauchy Problem and Initial Conditions; 5.2 The Weak Maximum Principle; 5.3 Solutions on Bounded Intervals; 5.4 The Heat Equation on the Real Line; 5.5 The Heat Equation on the Half-Line; 5.6 The Debate Over the Age of the Earth; 5.7 The Nonhomogeneous Heat Equation; 5.8 The Heat Equation in Two Space Variables; 6 Dirichlet and Neumann Problems
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8.4 The Telegraph Equation

Sommario/riassunto

A rigorous, yet accessible, introduction to partial differential equations-updated in a valuable new edition Beginning Partial Differential Equations, Second Edition provides a comprehensive introduction to partial differential equations (PDEs) with a special focus on the significance of characteristics, solutions by Fourier series, integrals and transforms, properties and physical interpretations of solutions, and a transition to the modern function space approach to PDEs. With its breadth of coverage, this new edition continues to present a broad introduction to the field, while also addre