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The Wave Equation V: Temporally Varying Inhomogeneity; 2.12 The Wave Equation VI: Drumming Up Some Interest; 2.13 Triple Fourier Series; 3 L2 Spaces: Optimal Contexts for Fourier Series; 3.1 The Mean Square Norm and the Inner Product on C(T); 3.2 The Vector Space L2(T); 3.3 More on L2(T); the Vector Space L1(T); 3.4 Norm Convergence of Fourier Series: A Theorem; 3.5 More on Integration; 3.6 Orthogonality, Orthonormality, and Fourier Series; 3.7 More on the Inner Product; 3.8 Orthonormal Bases for Product Domains
3.9 An Application: The Isoperimetric Problem3.10 What Is L2(T)?; 4 Sturm-Liouville Problems; 4.1 Definitions and Basic Properties; 4.2 Some Boundary Value Problems; 4.3 Bessel Functions I: Bessel's Equation of Order n; 4.4 Bessel Functions II: Fourier-Bessel Series; 4.5 Bessel Functions III: Boundary Value Problems; 4.6 Orthogonal Polynomials; 4.7 More on Legendre Polynomials; 5 Convolution and the Delta Function: A Splat and a Spike; 5.1 Convolution: What Is It?; 5.2 Convolution: When Is It Compactly Supported?; 5.3 Convolution: When Is It Bounded and Continuous?
5.4 Convolution: When Is It Differentiable?5.5 Convolution: An Example; 5.6 Convolution: When Is It In L1(R)? In L2(R) ?; 5.7 Approximate Identities and the Dirac Delta ""Function""; 6 Fourier Transforms and Fourier Integrals; 6.1 The Fourier Transform on L1(R): Basics; 6.2 More on the Fourier Transform on L1(R); 6.3 Low-Impact Fourier Transforms (Integration by Differentiation); 6.4 Fourier Inversion on FL1(R); 6.5 The Fourier Transform and Fourier Inversion on L2(R); 6.6 Fourier Inversion of Piecewise Smooth, Integrable Functions; 6.7 Fourier Cosine and Sine Transforms
6.8 Multivariable Fourier Transforms and Inversion

Sommario/riassunto

A reader-friendly, systematic introduction to Fourier analysis Rich in both theory and application, Fourier Analysis presents a unique and thorough approach to a key topic in advanced calculus. This pioneering resource tells the full story of Fourier analysis, including its history and its impact on the development of modern mathematical analysis, and also discusses essential concepts and today's applications. Written at a rigorous level, yet in an engaging style that does not dilute the material, Fourier Analysis brings two profound aspects of the discipline to the fo