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2.2.2 Fourier Transform and the Convolution Product2.2.3 Partial Fourier Transform of Functions; 2.2.4 Fourier Transform of Distributions from the Spaces S and D(Rn); 2.3 Laplace Transforms of Functions and Distributions; 2.3.1 Laplace Transforms of Functions; 2.3.2 Laplace Transforms of Distributions; 3 Variational Calculus and Differential Equations in Distributions; 3.1 Variational Calculus in Distributions; 3.1.1 Equations of the Euler-Poisson Type; 3.2 Ordinary Differential Equations; 3.3 Convolution Equations; 3.3.1 Convolution Algebras
3.3.2 Convolution Algebra D'+: Convolution Equations in D'+3.4 The Cauchy Problem for Linear Differential Equations with Constant Coefficients; 3.5 Partial Differential Equations: Fundamental Solutions and Solving the Cauchy Problem; 3.5.1 Fundamental Solution for the Longitudinal Vibrations of Viscoelastic Bars of Maxwell Type; 3.6 Wave Equation and the Solution of the Cauchy Problem; 3.7 Heat Equation and Cauchy Problem Solution; 3.8 Poisson Equation: Fundamental Solutions; 3.9 Green's Functions: Methods of Calculation; 3.9.1 Heat Conduction Equation
3.9.2 Green's Function for the Vibrating String4 Representation in Distributions of Mechanical and Physical Quantities; 4.1 Representation of Concentrated Forces; 4.2 Representation of Concentrated Moments; 4.2.1 Concentrate Moment of Linear Dipole Type; 4.2.2 Rotational Concentrated Moment (Center of Rotation); 4.2.3 Concentrated Moment of Plane Dipole Type (Center of Dilatation or Contraction); 4.3 Representation in Distributions of the Shear Forces and the Bending Moments; 4.3.1 Concentrated Force of Magnitude P Applied at the Point c in [a,b]
4.3.2 Concentrated Moment of Magnitude m Applied at the Point c in [a,b]

Sommario/riassunto

In this comprehensive monograph, the authors apply modern mathematical methods to the study of mechanical and physical phenomena or techniques in acoustics, optics, and electrostatics, where classical mathematical tools fail.They present a general method of approaching problems, pointing out different aspects and difficulties that may occur. With respect to the theory of distributions, only the results and the principle theorems are given as well as some mathematical results. The book also systematically deals with a large number of applications to problems of general Newtonian mec