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Nota di contenuto	Partial Differential Equations of Applied Mathematics; CONTENTS; Preface; 1 Random Walks and Partial Differential Equations; 1.1 The Diffusion Equation and Brownian Motion; Unrestricted Random Walks and their Limits; Brownian Motion; Restricted Random Walks and Their Limits; Fokker-Planck and Kolmogorov Equations; Properties of Partial Difference Equations and Related PDEs; Langevin Equation; Exercises 1.1; 1.2 The Telegrapher's Equation and Diffusion; Correlated Random Walks and Their Limits; Partial Difference Equations for Correlated Random Walks and Their Limits Telegrapher's, Diffusion, and Wave Equations Position-Dependent Correlated Random Walks and Their Limits; Exercises 1.2; 1.3 Laplace's Equation and Green's Function; Time-Independent Random Walks and Their Limits; Green's Function; Mean First Passage Times and Poisson's Equation; Position-Dependent Random Walks and Their Limits; Properties of Partial Difference Equations and Related PDEs; Exercises 1.3; 1.4 Random Walks and First Order PDEs; Random Walks and Linear First Order PDEs: Constant Transition Probabilities; Random Walks and Linear First Order PDEs: Variable Transition Probabilities

Random Walks and Nonlinear First Order PDEs Exercises 1.4; 1.5
Simulation of Random Walks Using Maple; Unrestricted Random Walks;
Restricted Random Walks; Correlated Random Walks; Time-
Independent Random Walks; Random Walks with Variable Transition
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2.1 Introduction; Exercises 2.1; 2.2 Linear First Order Partial Differential
Equations; Method of Characteristics; Examples; Generalized Solutions;
Characteristic Initial Value Problems; Exercises 2.2; 2.3 Quasilinear First
Order Partial Differential Equations
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Nonlinear Wave Motion: An Example; Generalized Solutions and Shock
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Differential Equations; Quasilinear First Order Partial Differential
Equations; Nonlinear First Order Partial Differential Equations; Exercises
2.5; Appendix: Envelopes of Curves and Surfaces; 3 Classification of
Equations and Characteristics
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Parabolic Type; Canonical Forms for Equations of Elliptic Type;
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Linear PDEs: Classification and Characteristics; Systems of Hyperbolic
Type; Higher-Order and Nonlinear PDEs
Quasilinear First Order Systems and Normal Forms

Sommario/riassunto

This new edition features the latest tools for modeling, characterizing, and solving partial differential equations. The Third Edition of this classic text offers a comprehensive guide to modeling, characterizing, and solving partial differential equations (PDEs). The author provides all the theory and tools necessary to solve problems via exact, approximate, and numerical methods. The Third Edition retains all the hallmarks of its previous editions, including an emphasis on practical applications, clear writing style and logical organization, and extensive use of real-world examples.
