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Inverse Function Theorem; 6.2 Graphs; 6.3 Manifolds in Parametric Representations; 6.4 Manifolds in Implicit Representations; 6.5 Differentiation on Manifolds; 7 Higher-Order Derivatives
7.1 Definitions7.2 Change of Order in Differentiation; 7.3 Sequences of Polynomials; 7.4 Local Extremal Values; PART III INTEGRATION; 8 Multiple Integrals; 8.1 Jordan Sets and Volume; 8.2 Integrals; 8.3 Images of Jordan Sets; 8.4 Change of Variables; 9 Integration on Manifolds; 9.1 Euclidean Volumes; 9.2 Integration on Manifolds; 9.3 Oriented Manifolds; 9.4 Integrals of Vector Fields; 9.5 Integrals of Tensor Fields; 9.6 Integration on Graphs; 10 Stokes' Theorem; 10.1 Basic Stokes' Theorem; 10.2 Flows; 10.3 Flux and Change of Volume in a Flow; 10.4 Exterior Derivatives
10.5 Regular and Almost Regular Sets10.6 Stokes' theorem on Manifolds; PART IV APPENDICES; Appendix A: Construction of the real numbers; A.1 Field and Order Axioms in Q; A.2 Equivalence Classes of Cauchy Sequences in Q; A.3 Completeness of R; Appendix B: Dimension of a vector space; B.1 Bases and linearly independent subsets; Appendix C: Determinants; C.1 Permutations; C.2 Determinants of Square Matrices; C.3 Determinant Functions; C.4 Determinant of a Linear Transformation; C.5 Determinants on Cartesian Products; C.6 Determinants in Euclidean Spaces; C.7 Trace of an Operator
Appendix D: Partitions of unityD.1 Partitions of Unity; Index

Sommario/riassunto

A rigorous introduction to calculus in vector spaces The concepts and theorems of advanced calculus combined with related computational methods are essential to understanding nearly all areas of quantitative science. Analysis in Vector Spaces presents the central results of this classic subject through rigorous arguments, discussions, and examples. The book aims to cultivate not only knowledge of the major theoretical results, but also the geometric intuition needed for both mathematical problem-solving and modeling in the formal sciences. The authors begin with an outline of