

图书基本信息

书名：<<现代几何学方法和应用 第2卷(影印版)>>

13位ISBN编号：9787506201339

10位ISBN编号：750620133X

出版时间：1999-11

出版公司：世界图书出版公司

作者：B.A.Dubrovin,A.T.Fomenko,S.P.Novikov

页数：430

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

内容概要

Up until recently, Riemannian geometry and basic topology were not included, even by departments or faculties of mathematics, as compulsory subjects in a university-level mathematical education. The standard courses in the classical differential geometry of curves and surfaces which were given instead (and still are given in some places) have come gradually to be viewed as anachronisms. However, there has been hitherto no unanimous agreement as to exactly how such courses should be brought up to date, that is to say, which parts of modern geometry should be regarded as absolutely essential to a modern mathematical education, and what might be the appropriate level of abstractness of their exposition.

书籍目录

CHAPTER1 Examples of Manifolds 1. The concept of a manifold 1.1. Definition of a manifold 1.2. Mappings of manifolds; tensors on manifolds 1.3. Embeddings and immersions of manifolds. Manifolds with boundary 2. The simplest examples of manifolds 2.1. Surfaces in Euclidean space. Transformation groups as manifolds 2.2. Projective spaces 2.3. Exercises 3. Essential facts from the theory of Lie groups 3.1. The structure of a neighbourhood of the identity of a Lie group The Lie algebra of a Lie group. Semisimplicity 3.2. The concept of a linear representation. An example of a non-matrix Lie group 4. Complex manifolds 4.1. Definitions and examples 4.2. Riemann surfaces as manifolds 5. The simplest homogeneous spaces 5.1. Action of a group on a manifold 5.2. Examples of homogeneous spaces 5.3. Exercises 6. Spaces of constant curvature (symmetric spaces) 6.1. The concept of a symmetric space 6.2. The isometry group of a manifold. Properties of its Lie algebra 6.3. Symmetric spaces of the first and second types 6.4. Lie groups as symmetric spaces 6.5. Constructing symmetric spaces. Examples 6.6. Exercises 7. Vector bundles on a manifold 7.1. Constructions involving tangent vectors 7.2. The normal vector bundle on a submanifold CHAPTER 2 Foundational Questions. Essential Facts Concerning Functions on a Manifold. Typical Smooth Mappings 8. Partitions of unity and their applications 8.1. Partitions of unity 8.2. The simplest applications of partitions of unity. Integrals over a manifold and the general Stokes formula 8.3. Invariant metrics 9. The realization of compact manifolds as surfaces in \mathbb{R}^n 10. Various properties of smooth maps of manifolds 10.1. Approximation of continuous mappings by smooth ones 10.2. Sard's theorem 10.3. Transversal regularity 10.4. Morse functions 11. Applications of Sard's theorem 11.1. The existence of embeddings and immersions 11.2. The construction of Morse functions as height functions 11.3. Focal points CHAPTER 3 The Degree of a Mapping. The Intersection Index of Submanifolds Applications 12. The concept of homotopy 12.1. Definition of homotopy. Approximation of continuous maps and homotopies by smooth ones 12.2. Relative homotopies 13. The degree of a map 13.1. Definition of degree 13.2. Generalizations of the concept of degree 13.3. Classification of homotopy classes of maps from an arbitrary manifold to a sphere 13.4. The simplest examples 14. Applications of the degree of a mapping 14.1. The relationship between degree and integral 14.2. The degree of a vector field on a hypersurface 14.3. The Whitney number. The Gauss-Bonnet formula 14.4. The index of a singular point of a vector field 14.5. Transverse surfaces of a vector field. The Poincare-Bendixson theorem 15. The intersection index and applications 15.1. Definition of the intersection index 15.2. The total index of a vector field CHAPTER 4 Orientability of Manifolds. The Fundamental Group Covering Spaces (Fibre Bundles with Discrete Fibre) 16. Orientability and homotopies of closed paths 17. The fundamental group 18. Covering maps and covering homotopies 19. Covering maps and the fundamental group. Computation of the fundamental group of certain manifolds 20. The discrete groups of motions of the Lobachevskian plane CHAPTER 5 Homotopy Groups 21. Definition of the absolute and relative homotopy groups. Examples 22. Covering homotopies. The homotopy groups of covering spaces and loop spaces 23. Facts concerning the homotopy groups of spheres. Framed normal bundles. The Hopf invariant CHAPTER 6 Smooth Fibre Bundles 24. The homotopy theory of fibre bundles 25. The differential geometry of fibre bundles 26. Knots and links. Braids CHAPTER 7 Some Examples of Dynamical Systems and Foliations on Manifolds 27. The simplest concepts of the qualitative theory of dynamical systems Two-dimensional manifolds 28. Hamiltonian systems on manifolds. Liouville's theorem. Examples 29. Foliations 30. Variational problems involving higher derivatives CHAPTER 8 The Global Structure of Solutions of Higher-Dimensional Variational Problems 31. Some manifolds arising in the general theory of relativity (GTR) 32. Some examples of global solutions of the Yang-Mills equations Chiral 33. The minimality of complex submanifolds Bibliography Index

版权说明

本站所提供下载的PDF图书仅提供预览和简介, 请支持正版图书。

更多资源请访问:<http://www.tushu007.com>