1. Record Nr. UNINA9910544876403321

Autore	Prasolov V. V (Viktor Vasilevich)
Titolo	Differential geometry / / Victor V. Prasolov
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-030-92249-9
Descrizione fisica	1 online resource (278 pages)
Collana	Moscow Lectures ; ; Volume 8
Disciplina	516.36
Soggetti	Geometry, Differential Geometria diferencial Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Basic Notation -- Contents -- 1 Curves in the Plane -- 1.1 Curvature and the Frenet-Serret Formulas -- 1.2 Osculating Circles -- 1.3 The Total Curvature of a Closed Plane Curve -- 1.4 Four-Vertex Theorem -- 1.5 The Natural Equation of a Plane Curve -- 1.6 Whitney-Graustein Theorem -- 1.7 Tube Area and Steiner's Formula -- 1.8 The Envelope of a Family of Curves -- 1.9 Evolute and Involute -- 1.10 Isoperimetric Inequality -- 1.11 Affine Unimodular Differential Geometry -- 1.12 Projective Differential Geometry -- 1.13 The Measure of the Set of Lines Intersecting a Given Curve -- 1.14 Solutions of Problems -- 2 Curves in Space -- 2.1 Curvature and Torsion: The Frenet-Serret Formulas -- 2.2 An Osculating Plane -- 2.3 Total Curvature of a Closed Curve -- 2.4 Bertrand Curves -- 2.5 The Frenet-Serret Formulas in Many-Dimensional Space -- 2.6 Solutions of Problems -- 3 Surfaces in Space -- 3.1 The First Quadratic Form -- 3.2 The Darboux Frame of a Curve on a Surface -- 3.3 Geodesics -- 3.4 The Second Quadratic Form -- 3.5 Gaussian Curvature -- 3.6 Gaussian Curvature and Differential Forms -- 3.7 The Gauss-Bonnet Theorem -- 3.8 Christoffel Symbols -- 3.9 The Spherical Gauss Map -- 3.10 The Geodesic Equation -- 3.11 Parallel Transport Along a Curve -- 3.12 Covariant Differentiation -- 3.13 The Gauss and Codazzi-Mainardi Equations -- 3.14 Riemann Curvature Tensor -- 3.15 Exponential Map

-- 3.16 Lines of Curvature and Asymptotic Lines -- 3.17 Minimal Surfaces -- 3.18 The First Variation Formula -- 3.19 The Second Variation Formula -- 3.20 Jacobi Vector Fields and Conjugate Points -- 3.21 Jacobi's Theorem on a Normal Spherical Image -- 3.22 Surfaces of Constant Gaussian Curvature -- 3.23 Rigidity (Unbendability) of the Sphere -- 3.24 Convex Surfaces: Hadamard's Theorem -- 3.25 The Laplace-Beltrami Operator -- 3.26 Solutions of Problems.
4 Hypersurfaces in Rn+1: Connections -- 4.1 The Weingarten Operator -- 4.2 Connections on Hypersurfaces -- 4.3 Geodesics on Hypersurfaces -- 4.4 Convex Hypersurfaces -- 4.5 Minimal Hypersurfaces -- 4.6 Steiner's Formula -- 4.7 Connections on Vector Bundles -- 4.8 Geodesics -- 4.9 The Curvature Tensor and the Torsion Tensor -- 4.10 The Curvature Matrix of a Connection -- 4.11 Solutions of Problems -- 5 Riemannian Manifolds -- 5.1 Levi-Cività Connection -- 5.2 Symmetries of the Riemann Tensor -- 5.3 Geodesics on Riemannian Manifolds -- 5.4 The Hopf-Rinow Theorem -- 5.5 The Existence of Complete Riemannian Metrics -- 5.6 Covariant Differentiation of Tensors -- 5.7 Sectional Curvature -- 5.8 Ricci Tensor -- 5.9 Riemannian Submanifolds -- 5.10 Totally Geodesic Submanifolds -- 5.11 Jacobi Fields and Conjugate Points -- 5.12 Product of Riemannian Manifolds -- 5.13 Holonomy -- 5.14 Commutator and Curvature -- 5.15 Solutions of Problems -- 6 Lie Groups -- 6.1 Lie Groups and Algebras -- 6.2 Adjoint Representation and the Killing Form -- 6.3 Connections and Metrics on Lie Groups -- 6.4 Maurer-Cartan Equations -- 6.5 Invariant Integration on a Compact Lie Group -- 6.6 Lie Derivative -- 6.7 Infinitesimal Isometries -- 6.8 Homogeneous Spaces -- 6.9 Symmetric Spaces -- 6.10 Solutions of Problems -- 7 Comparison Theorems, Curvature and Topology, and Laplacian -- 7.1 The Simplest Comparison Theorems -- 7.2 The Cartan-Hadamard Theorem -- 7.3 Manifolds of Positive Curvature -- 7.4 Manifolds of Constant Curvature -- 7.5 Laplace Operator -- 7.6 Solutions of Problems -- 8 Appendix -- 8.1 Differentiation of Determinants -- 8.2 Jacobi Identity for the Commutator of Vector Fields -- 8.3 The Differential of a 1-Form -- Bibliography -- Index.