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| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | 0 Introduction and Foundations -- 0.1 The Fundamental Concepts and Problems of Topology -- 0.2 Simplicial Complexes -- 0.3 The Jordan Curve Theorem -- 0.4 Algorithms -- 0.5 Combinatorial Group Theory -- 1 Complex Analysis and Surface Topology -- 1.1 Riemann Surfaces |

-- 1.2 Nonorientable Surfaces -- 1.3 The Classification Theorem for Surfaces -- 1.4 Covering Surfaces -- 2 Graphs and Free Groups -- 2.1 Realization of Free Groups by Graphs -- 2.2 Realization of Subgroups -- 3 Foundations for the Fundamental Group -- 3.1 The Fundamental Group -- 3.2 The Fundamental Group of the Circle -- 3.3 Deformation Retracts -- 3.4 The Seifert—Van Kampen Theorem -- 3.5 Direct Products -- 4 Fundamental Groups of Complexes -- 4.1 Poincaré's Method for Computing Presentations -- 4.2 Examples -- 4.3 Surface Complexes and Subgroup Theorems -- 5 Homology Theory and Abelianization -- 5.1 Homology Theory -- 5.2 The Structure Theorem for Finitely Generated Abelian Groups -- 5.3 Abelianization -- 6 Curves on Surfaces -- 6.1 Dehn's Algorithm -- 6.2 Simple Curves on Surfaces -- 6.3 Simplification of Simple Curves by Homeomorphisms -- 6.4 The Mapping Class Group of the Torus -- 7 Knots and Braids -- 7.1 Dehn and Schreier's Analysis of the Torus Knot Groups -- 7.2 Cyclic Coverings -- 7.3 Braids -- 8 Three-Dimensional Manifolds -- 8.1 Open Problems in Three-Dimensional Topology -- 8.2 Polyhedral Schemata -- 8.3 Heegaard Splittings -- 8.4 Surgery -- 8.5 Branched Coverings -- 9 Unsolvable Problems -- 9.1 Computation -- 9.2 HNN Extensions -- 9.3 Unsolvable Problems in Group Theory -- 9.4 The Homeomorphism Problem -- Bibliography and Chronology.

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## Sommario/riassunto

In recent years, many students have been introduced to topology in high school mathematics. Having met the Mobius band, the seven bridges of Königsberg, Euler's polyhedron formula, and knots, the student is led to expect that these picturesque ideas will come to full flower in university topology courses. What a disappointment "undergraduate topology" proves to be! In most institutions it is either a service course for analysts, on abstract spaces, or else an introduction to homological algebra in which the only geometric activity is the completion of commutative diagrams. Pictures are kept to a minimum, and at the end the student still does not understand the simplest topological facts, such as the reason why knots exist. In my opinion, a well-balanced introduction to topology should stress its intuitive geometric aspect, while admitting the legitimate interest that analysts and algebraists have in the subject. At any rate, this is the aim of the present book. In support of this view, I have followed the historical development where practicable, since it clearly shows the influence of geometric thought at all stages. This is not to claim that topology received its main impetus from geometric recreations like the seven bridges; rather, it resulted from the visualization of problems from other parts of mathematics—complex analysis (Riemann), mechanics (Poincaré), and group theory (Dehn). It is these connections to other parts of mathematics which make topology an important as well as a beautiful subject.

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