<<拓扑学教程>>

图书基本信息

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前言

For mathematicians. topology is a fundamental mathematical language widely used in many fields. For students, topology is an intellectually challenging and rewarding subject. This textbook aims to address the subject of topology from both angles. The development of the content is based on the following considerations.

First, the topology theory has the point set as well as the combinatorial (or algebraic) aspects. This book intends to give students a more comprehensive view of topology. So materials in point set topology and combinatorial topology are arranged in alternating chapters. Of course only the most basic topics can be covered in a semester. This means point set topology up to Hausdorff. connected, and compact properties, and combinatorial topology up to the Euler number and the classification of surfaces. A final chapter is added to cover the important and useful topics in point set topology. The topics in the final chapter are not covered in my lecture. Second. the basic topological theory is a tool used for describing certain aspects of mathematics. So we should keep in mind how the topology is actually used in the other fields 0f mathematlcs. For example. the topologies are always iutroduced from topological basis or subbasis in practical applications. Therefore this book introduces the topological basis before the concept of topology, and emphasizes how to " compute " the topological concepts by making use of topological basis. Third, the theory of point set topology can be very abstract. and the axiomatic approach can be daunting for students. This book starts with metric spaces, which is more concrete and familiar to students. The topological concepts are defined from the viewpoint of metrics but are quickly reinterpreted in terms of balls. Later on, by replacing the balls with the topological basis, students can easily understand the same concepts in the more abstract setting. Fourth, the effective learning of abstract theory requires lots of practice. The book contains plenty of exercises. Moreover, the exercises immediately follow discussions, instead of being listed separately at the end of sections. Many exercises require the students to compute topological concepts in very specific and concrete topological spaces. There are also many exercises that ask the students to prove some basic results, some of which are used in the proofs. The book was originally the lecture note for my topology course in The Hong Kong University of Science and Technology.1 would like to thank the university and enthusiastic students for their support.

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内容概要

The aim of the book is to give a broad introduction to topology for undergraduate students. It covers the most important and useful parts of point-set as well as combinatorial topology. The development of the materia is from simple to complex, concrete to abstract, and appeals to the intuition of the reader. Attention is also paid to how topology is actually used in the other fields of mathematics. Qver 150 illustrations, 160 examples and 600 exercises will help readers to practice and fully understand the subject.

作者简介

Dr. Min Yan is a Professor at the Department of Mathematics of The Hong Kong University of Science and Technology. He has published numerous research papers in diverse areas of mathematics, including topology, combinatorics, Hopf algebra and integrable systems.

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