<<欧氏空间上的勒贝格积分>>

图书基本信息

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前言

"Though of real knowledge there be little, yet of books there are plenty" -Herman Melville, Moby Dick, Chapter XXXI.The treatment of integration developed by the French mathematician Henri Lebesgue （1875-1944） almost a century ago has proved to be indispensable in many areas of mathematics. Lebesgue's theory is of such extreme importance because on the one hand it has rendered previous theories of integration virtually obsolete, and on the other hand it has not been replaced with a significantly different, better theory. Most subsequent important investigations of integration theory have extended or illuminated Lebesgue's work.In fact, as is so often the case in a new field of mathematics, many of the best consequences were given by the originator. For example,Lebesgue's dominated convergence theorem, Lebesgue's increasing convergence theorem, the theory of the Lebesgue function of the Cantor ternary set, and Lebesgue's theory of differentiation of indefinite integrals.Naturally, many splendid textbooks have been produced in this area.I shall list some of these below. They axe quite varied in their approach to the subject. My aims in the present book are as follows.1. To present a slow introduction to Lebesgue integration Most books nowadays take the opposite tack. I have no argument with their approach, except that I feel that many students who see only a very rapid approach tend to lack strong intuition about measure and integration. That is why I have made Chapter 2, "Lebesgue measure on Rn， "so lengthy and have restricted it to Euclidean space, and why I have （somewhat inconveniently） placed Chapter 3, "Invaxiance of Lebesgue measure," before Pubini's theorem. In my approach I have omitted much important material, for the sake of concreteness. As the title of the book signifies, I restrict attention almost entirely to Euclidean space.2. To deal with n-dimensional spaces from 'the outset. I believe this is preferable to one standard approach to the theory which first thoroughly treats integration on the real line and then generalizes. There are several reasons for this belief. One is quite simply that significant figures are frequently easier to sketch in IRe than in R1 ！
Another is that some things in IR1 are so special that the generalization to Rn is not clear; for example, the structure of the most general open set in R1 is essentially trivial —— it must be a disjoint union of open intervals （see Problem 2.6）. A third is that coping with the n-dimensional case from the outset causes the learner to realize that it is not significantly more difficult than the one-dimensional case as far as many aspects of integration are concerned.3. To provide a thorough treatment of Fourier analysis. One of the triumphs of Lebesgue integration is the fact that it provides definitive answers to many questions of Fourier analysis. I feel that without a thorough study of this topic the student is simply not well educated in integration theory. Chapter 13 is a very long one on the Fourier transform in several variables, and Chapter 14 also a very long one on Fourier series in one variable.

内容概要

本书简明、详细地介绍勒贝格测度和Rn上的积分。
本书的基本目的有四个，介绍勒贝格积分；从一开始引入n维空间；彻底介绍傅里叶积分；深入讲述实分析。
贯穿全书的大量练习可以增强读者对知识的理解。
目次：Rn导论；Rn勒贝格测度；勒贝格积分的不变性；一些有趣的集合；集合代数和可测函数；积分；Rn勒贝格积分；Rn的Fubini定理；Gamma函数；Lp空间；抽象测度的乘积；卷积；Rn+上的傅里叶变换；单变量傅里叶积分；微分；R上函数的微分。
　　读者对象：本书适用于数学专业的学生、老师和相关的科研人员。

书籍目录

章节摘录

插图：

编辑推荐

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