<<组合数学>>

图书基本信息

书名：<<组合数学>>

13位ISBN编号：9787111265252

10位ISBN编号：7111265254

出版时间：2009-3

出版时间：机械工业出版社

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页数：605

前言

I have made some substantial changes in this new edition of Introductory Combinatorics， and they are summarized as follows: In Chapter 1, a new section （Section 1.6） on mutually overlapping circles has been added to illustrate some of the counting techniques in later chapters. Previously the content of this section occured in Chapter 7. The old section on cutting a cube in Chapter 1 has been deleted, but the content appears as an exercise. Chapter 2 in the previous edition （The Pigeonhole Principle） has become Chapter 3. Chapter 3 in the previous edition, on permutations and combinations, is now Chapter 2. Pascals formula, which in the previous edition first appeared in Chapter 5, is now in Chapter 2. In addition, we have de-emphasized the use of the term combination as it applies to a set, using the essentially equivalent term of subset for clarity. However, in the case of multisets, we continue to use combination instead of, to our mind, the more cumbersome term submultiset.
Chapter 2 now contains a short section （Section 3.6） on finite probability. Chapter 3 now contains a proof of Ramseys theorem in the case of pairs. Some of the biggest changes occur in Chapter 7, in which generating functions and exponential generating functions have been moved to earlier in the chapter （Sections 7.2 and 7.3） and have become more central. The section on partition numbers （Section 8.3） has been expanded. Chapter 9 in the previous edition, on matchings in bipartite graphs, has undergone a major change. It is now an interlude chapter （Chapter 9） on systems of distinct representatives （SDRs）——the marriage and stable marriage problemsand the discussion on bipartite graphs has been removed. As a result of the change in Chapter 9, in the introductory chapter on graph theory （Chapter 11）, there is no longer the assumption that bipartite graphs have been discussed previously.

内容概要

本书是系统阐述组合数学基础、理论、方法和实例的优秀教材，出版30多年来多次改版，被MIT、哥伦比亚大学、UIUC、威斯康星大学等众多国外高校采用，对国内外组合数学教学产生了较大影响，也是相关学科的主要参考文献之一。
　本书侧重于组合数学的概念和思想。
包括鸽巢原理、计数技术、排列组合、P61ya计数法、二项式系数、容斥原理、生成函数和递推关系以及组合结构（匹配、实验设计、图）等。
深入浅出地表达了作者对该领域全面和深刻的理解。
除包含第4版中的内容外，本版又进行了更新，增加了有限概率、匹配数等内容。
此外，各章均包含大量练习题，并在书末给出了参考答案与提示。

作者简介

Richard A．Brualdi美国威斯康星大学麦迪逊分校数学系教授（现已退休），曾任该系主任多年。
他的研究方向包括组合数学、图论、线性代数和矩阵理论．编码理论等。
Brualdi教授的学术活动非常丰富，担任过多种学术期刊的主编。
2000年由于“在组合数学研究中所做出的杰出终身成就

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章节摘录

Chapter 3　　The Pigeonhole Principle　　We consider in this chapter an important，but elementary, combinatorial principle that can be used to solve a variety of interesting problems, often with surprising conclusions. This principle is known under a variety of names, the most common of which are the pigeonhole principle, the Dirichlet drawer principle, and the shoebox principle.1 Formulated as a principle about pigeonholes, it says roughly that if a lot of pigeons fly into not too many pigeonholes, then at least one pigeonhole will be occupied by two or more pigeons. A more precise statement is given below.　　3.1 Pigeonhole Principle: Simple FormThe simplest form of the pigeonhole principle is tile following fairly obvious assertion.Theorem 3.1.1 If n+1 objects are distributed into n boxes, then at least one box contains two or more of the objects.　　Proof. The proof is by contradiction. If each of the n boxes contains at most one of the objects, then the total number of objects is at most 1 + 1 + ... +1（n ls）= n.Since we distribute n + 1 objects, some box contains at least two of the objects.　　Notice that neither the pigeonhole principle nor its proof gives any help in finding a box that contains two or more of the objects. They simply assert that if we examine each of the boxes, we will come upon a box that contains more than one object. The pigeonhole principle merely guarantees the existence of such a box. Thus, whenever the pigeonhole principle is applied to prove the existence of an arrangement or some phenomenon, it will give no indication of how to construct the arrangement or find an instance of the phenomenon other than to examine all possibilities.

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