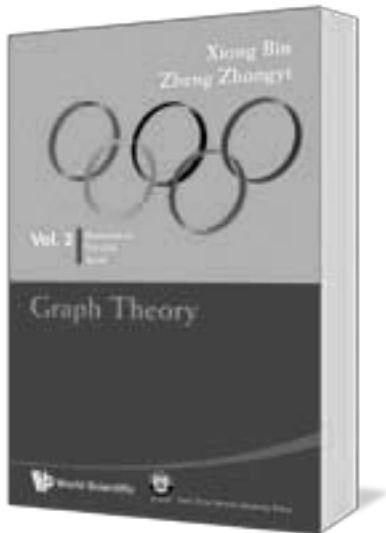


Combinatorics & Graph Theory 2010



:: New Textbook

Mathematical Olympiad Series – Vol. 3

GRAPH THEORY

by **Xiong Bin** (East China Normal University, China) & **Zheng Zhongyi** (High School Attached to Fudan University, China)

In 1736, the mathematician Euler invented graph theory while solving the Königsberg seven-bridge problem. Over 200 years later, graph theory remains the skeleton content of discrete mathematics, which serves as a theoretical basis for computer science and network information science. This book introduces some basic knowledge and the primary methods in graph theory by many interesting problems and games.

Contents: Definition of Graph; Vertex Degrees; Turan Theorem; Tree; Euler Problem; Hamilton Problem; Planar Graph; Ramsey Problem; Tournament Graph.

Readership: High-school mathematics students and teachers, coaches of mathematical olympiads, undergraduates and graduates in mathematics, non-experts interested in mathematical competitions.

100pp (approx.) Feb 2010
978-981-4271-12-7 (pbk) US\$25 £19



:: Bestselling Textbook

A WALK THROUGH COMBINATORICS An Introduction to Enumeration and Graph Theory (Second Edition)

by **Miklós Bóna** (University of Florida, USA)

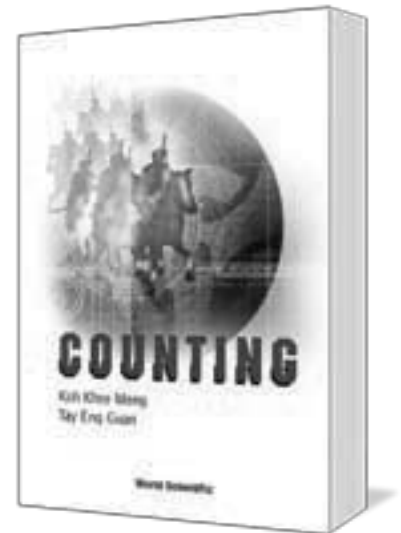
“Bóna’s book is an excellent choice for anyone who wants an introduction to this beautiful branch of mathematics ... Plentiful examples illustrate each of the topics included in the book. Bóna does a supreme job of walking us through combinatorics.”

Choice

This is a textbook for an introductory combinatorics course that can take up one or two semesters. An extensive list of problems, ranging from routine exercises to research questions, is included. In each section, there are also exercises that contain material not explicitly discussed in the preceding text, so as to provide instructors with extra choices if they want to shift the emphasis of their course.

Readership: Upper level undergraduates and graduate students in the field of combinatorics and graph theory.

492pp Oct 2006
978-981-256-885-4 US\$111 £64
978-981-256-886-1 (pbk) US\$67 £37



:: Bestselling Textbook

COUNTING

by **Koh Khee Meng** (National University of Singapore, Singapore) & **Tay Eng Guan** (Nanyang Technological University, Singapore)

“This book manages to make an area of mathematics traditionally considered difficult by students more accessible and is bound to captivate their attention with the numerous interesting exercises and applications it contains.”

Mathematics Abstracts

Contents: The Addition Principle; The Multiplication Principle; Subsets and Arrangements; Applications; The Bijection Principle; Distribution of Balls into Boxes; More Applications of (BP); Distribution of Distinct Balls into Distinct Boxes; Other Variations of the Distribution Problem; The Binomial Expansion; Some Useful Identities; Pascal’s Triangle; Miscellaneous Problems.

124pp May 2002
978-981-238-063-0 US\$32 £22
978-981-238-064-7 (pbk) US\$14 £9

Also available:
COUNTING
Supplementary Notes and
Solutions Manual

220pp Dec 2006
978-981-256-915-8 (pbk) US\$33 £20

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:: New Textbook

Peking University Series in Mathematics – Vol. 5

DIFFERENCE SETS AND THEIR APPLICATIONS

by **Weisheng Qiu** (Peking University, China)

This book introduces the recent progress on the multiplier conjecture, prime power conjecture, Lander conjecture; including the author's and his graduate student T Feng's work on the multiplier conjecture. It provides a sufficiently broad introduction to algebraic approach for studying difference sets, including group ring, representation theory of finite groups, cyclotomic fields, etc. It also introduces the intricate relationships between difference sets and cryptography, for example, quasi-perfect sequences and cyclic $(4n-1, 2n-1, n-1)$ - difference sets, bent functions and Hadamard difference sets, perfect nonlinear maps and semiregular relative difference sets.

Readership: Advanced undergraduates and graduate students in mathematics; researchers interested in the difference sets, cryptography.

300pp (approx.) Oct 2010
978-981-4280-76-1 US\$78 £59
978-981-4280-77-8(ebk) US\$101

:: New

Mathematical Olympiad Series – Vol. 4

COMBINATORIAL PROBLEMS IN MATHEMATICAL COMPETITIONS

by **Yao Zhang** (Hunan Normal University, P R China)

This book focuses on combinatorial problems in mathematical competitions. It provides basic knowledge on how to solve combinatorial problems in mathematical competitions, and also introduces important solutions to combinatorial problems and some typical problems with often-used solutions. Some enlightening and novel examples and exercises are well chosen in this book. With this book, readers can explore, analyze and summarize the ideas and methods of solving combinatorial problems. Their mathematical culture and ability will be improved remarkably after reading this book.

Readership: Students and teachers of high school, coaches of mathematical olympiads, undergraduates and graduates in mathematics, non-experts interested in mathematical competitions.

250pp (approx.) Jun 2010
978-981-283-949-7(pbk) US\$28 £21
978-981-283-950-3(ebk) US\$36

:: Textbook

DESIGN THEORY

by **Zhe-Xian Wan** (Chinese Academy of Sciences, China)

Contents: BIBDs; Symmetric BIBDs; Resolvable BIBDs; Orthogonal Latin Squares; Pairwise Balanced Designs and Group Divisible Designs; Construction of Some Families of BIBDs; t -Designs; Steiner Systems; Association Schemes and PBIBDs.

Readership: Graduate students and researchers in mathematics.

232pp Nov 2009
978-981-4287-42-5 US\$48 £36



CHROMATIC POLYNOMIALS AND CHROMATICITY OF GRAPHS

by **F M Dong** (Nanyang Technological University, Singapore), **K M Koh** (National University of Singapore, Singapore) & **K L Teo** (Massey University, New Zealand)

"This book is clearly written, well illustrated, and supplied with carefully designed exercises, it takes pleasure in using it as an graduate textbook or for independent study. It leads the reader to the frontiers of present research in the theory of chromatic polynomials and offers insight into some exciting development."

Zentralblatt MATH



Key Features

- Includes many exercises on chromatic polynomials
- Contains a comprehensive bibliography including a significant number of articles that have previously appeared only in Chinese
- The first three chapters can be used as an introductory course for graduate students

384pp Jun 2005
978-981-256-317-0 US\$126 £68
978-981-256-383-5(pbk) US\$67 £37
978-981-256-946-2(ebk) US\$164

:: Textbook

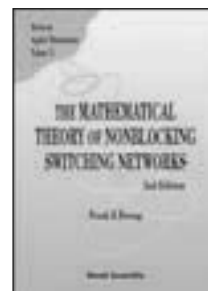
Series on Applied Mathematics – Vol. 15

THE MATHEMATICAL THEORY OF NONBLOCKING SWITCHING NETWORKS

(2nd Edition)

by **Frank K Hwang** (National Chiao-Tung University, Taiwan)

This comprehensively updated version puts more emphasis to the multicast and multirate networks which are under fast development recently due to their wide applications. This comprehensively updated new edition not only introduces the classical theory of the fundamental point-to-point network but also has a renewed emphasis on the latest multicast and multirate networks. The book can serve as either a one- or two-semester textbook for graduate students of information science, (electronic) communications, and applied mathematics. In addition, as all the relevant literature is organized and evaluated under one structured framework, the volume is an essential reference for researchers in those areas.



200pp Oct 2004
978-981-256-042-1 US\$58 £33

SCALE-ISOMETRIC POLYTOPAL GRAPHS IN HYPERCUBES AND CUBIC LATTICES

Polytopes in Hypercubes and Z_n

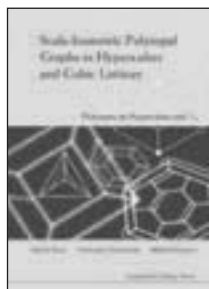
by **Michel Deza** (*Ecole Normale Supérieure & CNRS, Paris, France*), **Viatcheslav Grishukhin** (*Central Institute of Mathematical Economics, Moscow, Russia*) & **Mikhail Shtogrin** (*Steklov Mathematical Institute, Moscow, Russia*)

"The authors give concise and independent presentations of most of the topics and the readers of different backgrounds will be able to browse or study those chapters which are of interest for them. The presentation allows the book to serve a variety of needs."

Mathematical Reviews

The lists of polytopal graphs in the book come from broad areas of geometry, crystallography and graph theory. The book concentrates on such concise and, as much as possible, independent definitions. The scale-isometric embeddability — the main unifying question, to which those lists are subjected — is presented with the minimum of technicalities.

188pp **Feb 2004**
978-1-86094-421-5 **US\$67 £40**
978-1-86094-548-9(ebk) **US\$87**



SELECTED PAPERS OF ALAN J HOFFMAN

With Commentary

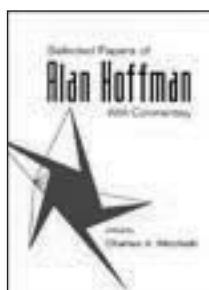
edited by **Charles A Michelli**
(State University of New York, USA)

"The papers themselves are the heart of the book, and each one has a brief introduction that explains its origins and motivation ... The whole is rounded off by a twenty-page autobiography, notable for its insights into the diverse aspects of the life of a professional mathematician, and anecdotes about the many interesting people whom Hoffman encountered."

The London Mathematical Society

This volume of Dr Hoffman's selected papers is divided into seven sections: geometry; combinatorics; matrix inequalities and eigenvalues; linear inequalities and linear programming; combinatorial optimization; greedy algorithms; graph spectra. Dr Hoffman has supplied background commentary and anecdotal remarks for each of the selected papers. He has also provided autobiographical notes showing how he chose mathematics as his profession, and the influences and motivations which shaped his career.

492pp **Aug 2003**
978-981-02-4198-8 **US\$155 £113**
978-981-279-693-6(ebk) **US\$202**



Series on Applied Mathematics – Vol. 13

INVERSE PROBLEMS FOR ELECTRICAL NETWORKS

by **Edward B Curtis** & **James A Morrow** (*University of Washington, Seattle*)

This book is a very timely exposition of part of an important subject which goes under the general name of "inverse problems". The analogous problem for continuous media has been very much studied, with a great deal of difficult mathematics involved, especially partial differential equations. Some of the researchers working on the inverse conductivity problem for continuous media (the problem of recovering the conductivity inside from measurements on the outside) have taken an interest in the authors' analysis of this similar problem for resistor networks.

Readership: Graduate students and researchers in applied mathematics and electrical and electronic engineering.

196pp **Mar 2000**
978-981-02-4174-2 **US\$61 £43**
978-981-279-396-6(ebk) **US\$79**

∴ Textbook

THE THEORY OF 2-STRUCTURES

A Framework for Decomposition and Transformation of Graphs

by **A Ehrenfeucht** (*University of Colorado, Boulder, USA*),
T Harju (*University of Turku, Finland*) & **G Rozenberg**
(Leiden University, The Netherlands)

"... this could be a wonderful book to use for a graduate course if the students were already familiar with the vast majority of the topics covered in the first two chapters, and had a reasonable background in algebra."

Mathematical Reviews

"The book makes the relevant graph theoretical and group theoretical tools available for researchers of graph grammars. Through exercises and rich bibliography the reader can easily deepen and widen his/her knowledge on 2-structures."

Acta Scientiarum Mathematicarum

Readership: Students and researchers interested in modern developments in graph theory, and in graph-based models in theoretical computer science.

308pp **Sept 1999**
978-981-02-4042-4 **US\$54 £35**

Series on Applied Mathematics - Vol. 12

COMBINATORIAL GROUP TESTING AND ITS APPLICATIONS

(2nd Edition)

by **Ding-Zhu Du** (*City University of Hong Kong, University of Minnesota, USA & Chinese Academy of Sciences, Beijing, China*) & **Frank K Hwang** (*National Chiao Tung University, Taiwan*)

There are two reasons for publishing a second edition of this book. The first is the usual need to update the text (after six years) and correct errors. The second — and more important — reason is to accommodate the recent sudden growth of interest in applying the idea of group testing to clone library screening. This development is much more than just a new application, since the new application brings with it new objectives which require a new twist of theory. It also embraces the growing importance of two topics: nonadaptive algorithms and error tolerance. Two new chapters, one on clone library screening and the other on error tolerance, have been added. Also included is a new chapter on counterfeit coins, the most famous search problem historically, which recently drew on an unexpected connection to some deep mathematical theory to yield new results. Finally, the chapters have been reorganized into parts to provide focuses and perspectives.

336pp **Dec 1999**
978-981-02-4107-0 **US\$75 £48**

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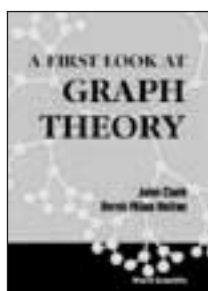
:: Bestselling Textbook

A FIRST LOOK AT GRAPH THEORY

by **John Clark & Derek Allan Holton** (*University of Otago, New Zealand*)

Contents: An Introduction to Graphs; Trees and Connectivity; Euler Tours and Hamiltonian Cycles; Matchings; Planar Graphs; Colouring; Directed Graphs; Networks; Ramsey Theory; Reconstruction.

Readership: Undergraduates in mathematics and computer science.



352pp
978-981-02-0489-1
978-981-02-0490-7 (pbk)

May 1991
US\$75 £56
US\$36 £26

:: Bestselling Textbook

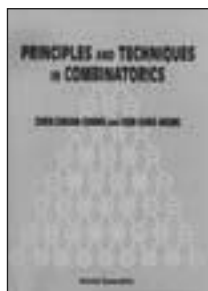
PRINCIPLES AND TECHNIQUES IN COMBINATORICS

by **Chen Chuan-Chong & Koh Khee-Meng** (*National University of Singapore*)

"This book should be a must for all mathematicians who are involved in the training of Mathematical Olympiad teams, but it will also be a valuable source of problems for university courses."

Mathematical Reviews

Contents: Permutations and Combinations; Binomial Coefficients and Multinomial Coefficients; The Pigeonhole Principle and Ramsey Numbers; The Principle of Inclusion and Exclusion; Generating Functions; Recurrence Relations.



312pp
978-981-02-1139-4 (pbk)

Jul 1992
US\$29 £16

DISCRETE MATHEMATICS, ALGORITHMS AND APPLICATIONS (DMAA)

Print / Online ISSN: 1793-8309 / 1793-8317
<http://www.worldscinet.com/dmaa>

The aim of this journal is to advance and promote the theory and applications of discrete mathematics, which is a research area in mathematics with applications in computer science, industrial engineering, bio-informatics, chemistry and communication networks. The journal encourages contributions from the two important parts of discrete mathematics, graph theory and combinatorics. The former includes structural graph theory, extremal graph theory, algebraic graph theory, random graphs and internet graphs. The latter consists of combinatorial design, combinatorial enumeration, coding theory, combinatorial probabilistic method, etc.

Co-Editor-in-Chief

Ding-Zhu Du, *University of Texas at Dallas, USA*

Jinlong Shu, *East China Normal University, P. R. China*

Abstracting/Indexing
INSPEC

:: Bestselling Textbook

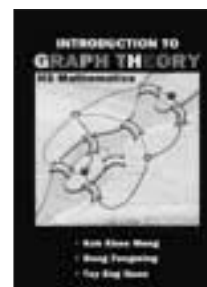
INTRODUCTION TO GRAPH THEORY

H3 Mathematics

by **Koh Khee Meng** (*National University of Singapore, Singapore*), **Dong Fengming & Tay Eng Guan** (*Nanyang Technological University, Singapore*)

Contents: Fundamental Concepts and Basic Results; Graph Isomorphisms, Subgraphs, the Complement of a Graph; Bipartite Graphs and Trees; Vertex-Colourings of Graphs; Matchings in Bipartite Graphs; Eulerian Multigraphs and Hamiltonian Graphs; Digraphs and Tournaments.

Readership: Junior college students and undergraduates studying mathematics and computer science.



244pp
978-981-270-525-9
978-981-270-386-6 (pbk)

Mar 2007
US\$98 £56
US\$61 £33

INTRODUCTION TO GRAPH THEORY

Solutions Manual

by **Koh Khee Meng** (*National University of Singapore, Singapore*), **Dong Fengming & Tay Eng Guan** (*Nanyang Technological University, Singapore*)

This is a companion to the book *Introduction to Graph Theory* (World Scientific, 2006). The student who has worked on the problems will find the solutions presented useful as a check and also as a model for rigorous mathematical writing. For ease of reference, each chapter recaps some of the important concepts and/or formulae from the earlier book.



Contents: Fundamental Concepts and Basic Results; Isomorphisms, Subgraphs and the Complement of a Graph; Bipartite Graphs and Trees; Vertex-Colourings of Graphs; Matchings in Bipartite Graphs; Eulerian Multigraphs and Hamiltonian Graphs; Digraphs and Tournaments.

260pp
978-981-277-175-9 (pbk)

Oct 2007
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