

Analyse combinatoire

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friendly conversational lecture style. Volume 1 includes formal proof techniques, a section on applications of compactness (including non-standard analysis), a generous dose of computability and its relation to the incompleteness phenomenon, and the first presentation of a complete proof of Gödel's second incompleteness theorem since Hilbert and Bernays' *Grundlagen*. Volume 2 on formal (ZFC) set theory, incorporates a self-contained "chapter 0" on proof techniques so that it is based on formal logic, in the style of Bourbaki. The emphasis on basic techniques will provide the reader with a solid foundation in set theory and provides a context for the presentation of advanced topics such as absoluteness, relative consistency results, two expositions of Gödel's constructible universe, numerous ways of viewing recursion, and a chapter on Cohen forcing.

Théorie des ensembles

F. William LAWVERE, Robert ROSEBRUGH. — **Sets for mathematics.** — Un vol. broché, 18×25, de XI, 261 p. — ISBN 0-521-01060-8. — Prix: £ 19.95. — Cambridge University Press, Cambridge, 2003.

Advanced undergraduate or beginning graduate students need a unified foundation for their study of mathematics. For the first time in a text, this book uses categorical algebra to build such a foundation, starting from intuitive descriptions of mathematically and physically common phenomena and advancing to a precise specification of the nature of categories of sets. Set theory as the algebra of mappings is introduced and developed as a unifying basis for advanced mathematical subjects such as algebra, geometry, analysis, and combinatorics. The formal study evolves from general axioms that express universal properties of sums, products, mapping sets, and natural number recursion. The distinctive features of Cantorian abstract sets, as contrasted with the variable and cohesive sets of geometry and analysis, are made explicit and taken as special axioms. Functor categories are introduced to model the variable sets used in geometry and to illustrate the failure of the axiom of choice. An appendix provides an explicit introduction to necessary concepts from logic, and an extensive glossary provides a window to the mathematical landscape.

Analyse combinatoire

Jiří HERMAN, Jaromir ŠIMŠA, Radan KUČERA. — **Counting and configurations: problems in combinatorics, arithmetic, and geometry.** — Translated by Karl Dilcher. — CMS Books in mathematics, vol. 12. — Un vol. relié, 16×24, de x, 392 p. — ISBN 0-387-95552-6. — Prix: € 69.95. — Springer, New York, 2003.

This book presents methods of solving problems in three areas of elementary combinatorial mathematics: classical combinatorics, combinatorial arithmetic, and combinatorial geometry. In each topic, brief theoretical discussions are immediately followed by carefully worked-out examples of increasing degrees of difficulty and by exercises that range from routine to rather challenging. Although this book emphasizes some methods that are not usually covered in beginning university courses, it nevertheless teaches techniques and skills that are useful not only in the specific topics covered here. There are approximately 310 examples and 650 exercises.

L. LOVÁSZ, J. PELIKÁN, K. VESZTERGOMBI. — **Discrete mathematics: elementary and beyond.** — Undergraduate texts in mathematics. — Un vol. broché, 15,5×23,5, de IX, 290 p. — ISBN 0-387-95585-2. — Prix: € 39.95. — Springer, New York, 2003.

Discrete mathematics is quickly becoming one of the most important areas of mathematical research, with applications to cryptography, linear programming, coding theory, and the theory of

computing. This book is aimed at undergraduate mathematics and computer science students interested in developing a feeling for what mathematics is all about, where mathematics can be helpful, and what kinds of questions mathematicians work on. The authors discuss a number of selected results and methods of discrete mathematics, mostly from the areas of combinatorics and graph theory, with a little number theory, probability and combinatorial geometry. Wherever possible, the authors use proofs and problem solving to help students understand the solutions to problems. In addition, there are numerous examples, figures, and exercises spread throughout the book.

Ordre, treillis

G. GIERZ, K.H. HOFMANN, K. KEIMEL, J.D. LAWSON, M.W. MISLOVE, D.S. SCOTT. — **Continuous lattices and domains.** — Encyclopedia of mathematics and its applications, vol. 93. — Un vol. relié, 16×24, de xxxvi, 591 p. — ISBN 0-521-80338-1. — Prix: £ 75.00. — Cambridge University Press, Cambridge, 2003.

Information content and programming semantics are just two of the applications of the mathematical concepts of order, continuity and domains. The authors develop the mathematical foundations of partially ordered sets with completeness properties of various degrees, in particular directed complete ordered sets and complete lattices. Uniquely, they focus on partially ordered sets that have an extra order relation, modelling the notion that one element 'finitely approximates' another, something closely related to intrinsic topologies linking order and topology. Extensive use is made of topological ideas, both by defining useful topologies on the structures themselves and by developing close connections with numerous aspects of topology. The theory so developed not only has applications to computer science but also within mathematics to such areas as analysis, the spectral theory of algebras and the theory of computability. This authoritative, comprehensive account of the subject will be essential for all those working in the area.

George GRÄTZER. — **General lattice theory.** — Second edition. — Un vol. broché, 17×24, de xix, 663 p. — ISBN 3-7643-6996-5. — Prix: SFr. 118.00. — Birkhäuser, Basel, 2003.

In the present edition of this widely known monograph, the work has been significantly updated and expanded. It contains an extensive new bibliography of 530 items and has been supplemented by eight appendices authored by an exceptional group of experts. The first appendix, written by the author, briefly reviews developments in lattice theory, specifically, the major results of the last 20 years and solutions of the problems proposed in the first edition. The other subjects concern distributive lattices and duality (Brian A. Davey and Hilary A. Priestley), continuous geometries (Friedrich Wehrung), projective lattice geometries (Marcus Greferath and Stefan E. Schmidt), varieties (Peter Jipsen and Henry Rose), free lattices (Ralph Freese), formal concept analysis (Bernhard Ganter and Rudolf Wille), and congruence lattices (Thomas Schmidt in collaboration with the author).

Théorie des nombres

M.A. BENNETT, B.C. BERNDT, N. BOSTON, H.G. DIAMOND, A.J. HILDEBRAND, W. PHILIPP, (Editors). — **Number theory for the millennium.** — Trois vol. brochés, 16×23,5, de respectivement 461 p., 447 p., 450 p. — ISBN 1-56881-126-8 (vol. 1), 1-56881-146-2 (vol. 2), 1-56881-152-7 (vol. 3). — Prix: US\$ 50.00. par volume. — A. K. Peters, Natick, Massachusetts, 2002.

These proceedings review some of the major number theory achievements of the 20th century. In addition to survey papers by invited speakers the volume contains numerous original