

# HIGHER ALGEBRA KUROSH

HIGHER ALGEBRA KUROSH IS A PIVOTAL SUBJECT IN THE REALM OF HIGHER MATHEMATICS, PARTICULARLY FOR STUDENTS AND PROFESSIONALS DELVING INTO ALGEBRAIC STRUCTURES. AUTHORED BY THE RENOWNED MATHEMATICIAN A. G. KUROSH, THIS TEXT OFFERS A PROFOUND EXPLORATION OF MODERN ALGEBRA, EMPHASIZING GROUP THEORY, RING THEORY, AND FIELD THEORY. THE BOOK IS NOT ONLY A FOUNDATIONAL RESOURCE FOR UNDERSTANDING ALGEBRA BUT ALSO SERVES AS A BRIDGE TO ADVANCED MATHEMATICAL CONCEPTS. THIS ARTICLE WILL DELVE INTO THE CORE THEMES OF "HIGHER ALGEBRA KUROSH," DISCUSS ITS SIGNIFICANCE IN MATHEMATICAL EDUCATION, AND PROVIDE INSIGHTS INTO THE APPLICATIONS OF HIGHER ALGEBRA. ADDITIONALLY, WE WILL EXPLORE THE STRUCTURE OF THE BOOK, KEY CONCEPTS, AND ITS RELEVANCE TO CURRENT STUDIES IN MATHEMATICS.

- UNDERSTANDING HIGHER ALGEBRA
- KEY CONCEPTS IN KUROSH'S HIGHER ALGEBRA
- APPLICATIONS OF HIGHER ALGEBRA
- IMPORTANCE OF HIGHER ALGEBRA IN EDUCATION
- CONCLUSION

## UNDERSTANDING HIGHER ALGEBRA

HIGHER ALGEBRA ENCOMPASSES A RANGE OF MATHEMATICAL TOPICS THAT EXTEND BEYOND BASIC ALGEBRAIC OPERATIONS. IT INVOLVES THE STUDY OF ALGEBRAIC STRUCTURES SUCH AS GROUPS, RINGS, AND FIELDS, WHICH ARE ESSENTIAL FOR ADVANCED MATHEMATICAL REASONING. KUROSH'S "HIGHER ALGEBRA" IS PARTICULARLY NOTEWORTHY AS IT LAYS THE GROUNDWORK FOR UNDERSTANDING THESE COMPLEX STRUCTURES. THE BOOK METICULOUSLY EXPLAINS THE PROPERTIES AND OPERATIONS ASSOCIATED WITH THESE ALGEBRAIC ENTITIES, MAKING IT A CRITICAL RESOURCE FOR STUDENTS PURSUING MATHEMATICS AT AN ADVANCED LEVEL.

THE KEY FOCUS AREAS OF HIGHER ALGEBRA INCLUDE THE MANIPULATION OF ALGEBRAIC EXPRESSIONS, THE SOLVING OF POLYNOMIAL EQUATIONS, AND THE EXPLORATION OF ALGEBRAIC SYSTEMS. UNDERSTANDING THESE CONCEPTS IS CRUCIAL FOR TACKLING MORE INTRICATE MATHEMATICAL CHALLENGES AND DEVELOPING A COMPREHENSIVE MATHEMATICAL TOOLKIT. KUROSH'S APPROACH COMBINES THEORY WITH PRACTICAL EXAMPLES, ENSURING THAT READERS NOT ONLY GRASP THEORETICAL CONCEPTS BUT ALSO SEE THEIR APPLICATIONS IN REAL-WORLD SCENARIOS.

## KEY CONCEPTS IN KUROSH'S HIGHER ALGEBRA

KUROSH'S "HIGHER ALGEBRA" IS RICH IN ESSENTIAL CONCEPTS THAT FORM THE BACKBONE OF MODERN ALGEBRA. AMONG THESE CONCEPTS, SEVERAL STAND OUT DUE TO THEIR FOUNDATIONAL IMPORTANCE:

### GROUPS

GROUPS ARE ONE OF THE MOST FUNDAMENTAL STRUCTURES IN ALGEBRA. A GROUP CONSISTS OF A SET EQUIPPED WITH A SINGLE OPERATION THAT SATISFIES FOUR KEY PROPERTIES: CLOSURE, ASSOCIATIVITY, IDENTITY, AND INVERTIBILITY. KUROSH EXAMINES VARIOUS TYPES OF GROUPS, INCLUDING:

- ABELIAN GROUPS
- FINITE GROUPS
- SYMMETRIC GROUPS

EACH OF THESE TYPES COMES WITH UNIQUE CHARACTERISTICS AND APPLICATIONS, WHICH KUROSH ELUCIDATES THROUGH DETAILED EXAMPLES AND EXERCISES.

## RINGS

RINGS EXPAND UPON THE CONCEPT OF GROUPS BY INTRODUCING A SECOND OPERATION, TYPICALLY ADDITION AND MULTIPLICATION. KUROSH DISCUSSES THE PROPERTIES OF RINGS, INCLUDING:

- COMMUTATIVE RINGS
- INTEGRAL DOMAINS
- FIELD EXTENSIONS

UNDERSTANDING RINGS IS CRUCIAL FOR STUDENTS AS THEY PROVIDE A FRAMEWORK FOR WORKING WITH POLYNOMIALS AND OTHER ALGEBRAIC STRUCTURES. KUROSH'S DETAILED EXPLANATIONS HELP READERS NAVIGATE THE COMPLEXITIES OF RING THEORY.

## FIELDS

FIELDS ARE ALGEBRAIC STRUCTURES IN WHICH DIVISION IS POSSIBLE, EXCLUDING DIVISION BY ZERO. KUROSH EMPHASIZES THE IMPORTANCE OF FIELDS IN ALGEBRA, PARTICULARLY IN THE STUDY OF VECTOR SPACES AND LINEAR ALGEBRA. KEY ASPECTS OF FIELDS COVERED IN THE BOOK INCLUDE:

- FIELD CHARACTERISTICS
- FINITE FIELDS
- ALGEBRAIC AND TRANSCENDENTAL EXTENSIONS

THESE CONCEPTS ARE VITAL FOR UNDERSTANDING HIGHER-LEVEL MATHEMATICS, AND KUROSH'S TEXT PROVIDES CLARITY AND DEPTH IN THEIR PRESENTATION.

## APPLICATIONS OF HIGHER ALGEBRA

THE APPLICATIONS OF HIGHER ALGEBRA ARE VAST AND VARIED, IMPACTING NUMEROUS FIELDS SUCH AS COMPUTER SCIENCE,

PHYSICS, AND ENGINEERING. UNDERSTANDING ALGEBRAIC STRUCTURES ALLOWS FOR BETTER PROBLEM-SOLVING TECHNIQUES AND THEORETICAL FRAMEWORKS THAT CAN BE APPLIED IN PRACTICAL SCENARIOS.

IN COMPUTER SCIENCE, FOR EXAMPLE, GROUP THEORY IS UTILIZED IN CRYPTOGRAPHY AND CODING THEORY, WHERE THE SECURITY OF DATA TRANSMISSION RELIES ON ALGEBRAIC METHODS. IN PHYSICS, ALGEBRAIC STRUCTURES HELP IN THE FORMULATION OF THEORIES AND MODELS THAT DESCRIBE THE PHYSICAL WORLD.

## IMPORTANCE OF HIGHER ALGEBRA IN EDUCATION

HIGHER ALGEBRA IS A CORNERSTONE OF MATHEMATICAL EDUCATION, PARTICULARLY IN UNIVERSITY-LEVEL COURSES. THE RIGOR AND DEPTH PROVIDED BY KUROSH'S BOOK EQUIP STUDENTS WITH THE NECESSARY SKILLS TO TACKLE ADVANCED MATHEMATICAL PROBLEMS. FURTHERMORE, THE LOGICAL REASONING AND ANALYTICAL SKILLS DEVELOPED THROUGH STUDYING HIGHER ALGEBRA ARE INVALUABLE ACROSS VARIOUS DISCIPLINES.

EDUCATORS OFTEN EMPHASIZE THE IMPORTANCE OF A STRONG FOUNDATION IN ALGEBRA, AS IT IS CRITICAL FOR SUCCESS IN FIELDS SUCH AS ENGINEERING, ECONOMICS, AND NATURAL SCIENCES. KUROSH'S "HIGHER ALGEBRA" THEREFORE SERVES NOT ONLY AS A TEXTBOOK BUT ALSO AS A COMPREHENSIVE GUIDE THAT FOSTERS A DEEP UNDERSTANDING OF ALGEBRAIC PRINCIPLES.

## CONCLUSION

IN SUMMARY, "HIGHER ALGEBRA KUROSH" IS AN INDISPENSABLE RESOURCE FOR ANYONE SEEKING TO MASTER THE COMPLEXITIES OF MODERN ALGEBRA. ITS THOROUGH EXPLORATION OF GROUPS, RINGS, AND FIELDS LAYS A SOLID FOUNDATION FOR ADVANCED MATHEMATICAL STUDY AND APPLICATION. THE RELEVANCE OF HIGHER ALGEBRA SPANS MULTIPLE DISCIPLINES, HIGHLIGHTING ITS IMPORTANCE IN BOTH THEORETICAL AND PRACTICAL CONTEXTS. AS STUDENTS AND PROFESSIONALS CONTINUE TO DELVE INTO THE INTRICACIES OF MATHEMATICS, KUROSH'S WORK WILL REMAIN A GUIDING BEACON IN THE PURSUIT OF ALGEBRAIC KNOWLEDGE.

### Q: WHAT IS THE MAIN FOCUS OF HIGHER ALGEBRA IN KUROSH'S BOOK?

A: THE MAIN FOCUS OF HIGHER ALGEBRA IN KUROSH'S BOOK IS THE STUDY OF ALGEBRAIC STRUCTURES SUCH AS GROUPS, RINGS, AND FIELDS, ALONG WITH THEIR PROPERTIES AND APPLICATIONS IN ADVANCED MATHEMATICS.

### Q: HOW DOES KUROSH'S "HIGHER ALGEBRA" BENEFIT STUDENTS?

A: KUROSH'S "HIGHER ALGEBRA" BENEFITS STUDENTS BY PROVIDING A COMPREHENSIVE UNDERSTANDING OF COMPLEX ALGEBRAIC CONCEPTS, ENHANCING THEIR PROBLEM-SOLVING SKILLS, AND PREPARING THEM FOR ADVANCED STUDIES IN MATHEMATICS AND RELATED FIELDS.

### Q: WHAT ARE THE KEY STRUCTURES DISCUSSED IN KUROSH'S HIGHER ALGEBRA?

A: THE KEY STRUCTURES DISCUSSED IN KUROSH'S HIGHER ALGEBRA INCLUDE GROUPS, RINGS, AND FIELDS, EACH WITH ITS OWN SET OF PROPERTIES AND APPLICATIONS IN VARIOUS MATHEMATICAL CONTEXTS.

### Q: WHY IS GROUP THEORY IMPORTANT IN HIGHER ALGEBRA?

A: GROUP THEORY IS IMPORTANT IN HIGHER ALGEBRA BECAUSE IT PROVIDES FOUNDATIONAL CONCEPTS THAT ARE APPLICABLE IN

VARIOUS FIELDS SUCH AS CRYPTOGRAPHY, PHYSICS, AND CODING THEORY, HELPING TO SOLVE COMPLEX PROBLEMS.

### **Q: WHAT RELEVANCE DOES HIGHER ALGEBRA HAVE IN MODERN APPLICATIONS?**

A: HIGHER ALGEBRA HAS SIGNIFICANT RELEVANCE IN MODERN APPLICATIONS, PARTICULARLY IN COMPUTER SCIENCE, PHYSICS, AND ENGINEERING, WHERE ALGEBRAIC STRUCTURES ARE USED TO DEVELOP THEORIES, MODELS, AND TECHNOLOGIES.

### **Q: HOW DOES KUROSH'S BOOK APPROACH THE TOPIC OF RINGS?**

A: KUROSH'S BOOK APPROACHES THE TOPIC OF RINGS BY EXPLORING THEIR PROPERTIES IN DETAIL, DISCUSSING VARIOUS TYPES OF RINGS, INCLUDING COMMUTATIVE RINGS AND INTEGRAL DOMAINS, AND PROVIDING EXAMPLES THAT ILLUSTRATE THEIR APPLICATIONS.

### **Q: WHAT SKILLS DO STUDENTS DEVELOP BY STUDYING HIGHER ALGEBRA?**

A: BY STUDYING HIGHER ALGEBRA, STUDENTS DEVELOP ANALYTICAL AND LOGICAL REASONING SKILLS, PROBLEM-SOLVING ABILITIES, AND A DEEP UNDERSTANDING OF COMPLEX ALGEBRAIC CONCEPTS THAT ARE CRUCIAL FOR ADVANCED MATHEMATICAL STUDIES.

### **Q: CAN HIGHER ALGEBRA BE APPLIED OUTSIDE OF MATHEMATICS?**

A: YES, HIGHER ALGEBRA CAN BE APPLIED OUTSIDE OF MATHEMATICS IN FIELDS SUCH AS COMPUTER SCIENCE, FINANCE, ENGINEERING, AND PHYSICS, WHERE ALGEBRAIC METHODS ARE USED TO MODEL AND SOLVE REAL-WORLD PROBLEMS.

### **Q: WHAT IS THE SIGNIFICANCE OF FIELDS IN KUROSH'S HIGHER ALGEBRA?**

A: THE SIGNIFICANCE OF FIELDS IN KUROSH'S HIGHER ALGEBRA LIES IN THEIR ROLE IN FACILITATING DIVISION AND SUPPORTING THE STUDY OF VECTOR SPACES AND LINEAR ALGEBRA, WHICH ARE ESSENTIAL COMPONENTS OF ADVANCED MATHEMATICS.

### **Q: HOW DOES KUROSH'S "HIGHER ALGEBRA" CONTRIBUTE TO MATHEMATICAL EDUCATION?**

A: KUROSH'S "HIGHER ALGEBRA" CONTRIBUTES TO MATHEMATICAL EDUCATION BY OFFERING A STRUCTURED AND THOROUGH EXPLORATION OF ALGEBRAIC CONCEPTS, PROVIDING EDUCATORS AND STUDENTS WITH A VITAL RESOURCE FOR TEACHING AND LEARNING ADVANCED MATHEMATICS.

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**higher algebra kurosh: Basic Structures of Modern Algebra** Y. Bahturin, 2013-03-09 This book has developed from a series of lectures which were given by the author in mechanics-mathematics department of the Moscow State University. In 1981 the course Additional chapters in algebra replaced the course General algebra which was founded by A. G. Kurosh (1908-1971), professor and head of the department of higher algebra for a period of several decades. The material of this course formed the basis of A. G. Kurosh's well-known book Lectures on general algebra (Moscow, 1962; 2-nd edition: Moscow, Nauka, 1973) and the book General algebra. Lectures of 1969-1970. (Moscow, Nauka, 1974). Another book based on the course, Elements of general algebra (M. : Nauka, 1983) was published by L. A. Skorniakov, professor, now deceased, in the same department. It should be noted that A. G. Kurosh was not only the lecturer for the course General algebra but he was also the recognized leader of the scientific school of the same name. It is difficult to determine the limits of this school; however, the Lectures . . . of 1962 mentioned above contain some material which exceed these limits. Eventually this effect intensified: the lectures of the course were given by many well-known scientists, and some of them see themselves as general algebraists. Each lecturer brought significant originality not only in presentation of the material but in the substance of the course. Therefore not all material which is now accepted as necessary for algebraic students fits within the scope of general algebra.

**higher algebra kurosh: Semigroups and Automata** Uno Kaljulaid, 2006 This volume provides a selection of previously published papers and manuscripts of Uno Kaljulaid, an eminent Estonian algebraist of the last century. The central part of the book is the English translation of Kaljulaid's 1979 Candidate thesis, which originally was typewritten in Russian and manufactured in not so many copies. The thesis is devoted to representation theory in the spirit of his thesis advisor B.I. Plotkin: representations of semigroups and algebras, especially extension to this situation, and application of the notion of triangular product of representations for groups introduced by Plotkin. Through representation theory, Kaljulaid became also interested in automata theory, which at a later phase became his main area of interest. Another field of research concerns combinatorics. Besides being an outstanding and most dedicated mathematician, Uno Kaljulaid was also very much interested in the history of mathematics. In particular, he took a vivid interest in the life and work of the great 19th century Dorpat-Tartu algebraist Th. Molien. Kaljulaid was also very interested in teaching and exposition, or popularization of mathematics. Some of his more popular-scientific papers were published in an Estonian language journal Matemaatika ja Kaasaeg (Mathematics and

Our Age). Among them, there is a whole series of papers about algebraic matters, culminating in a brilliant, elementary - although partly rather philosophical - essay devoted to Galois theory. Another such series is his excellent essay of Diophantine Geometry in various installments, followed by his loge to another of his teachers Yu. I. Manin. It is believed that the inclusion of these papers here will make it more interesting for beginners, and perhaps even contribute to attracting young people to mathematics.

**higher algebra kurosh: Elements of Quasigroup Theory and Applications** Victor Shcherbacov, 2017-05-12 Understanding Interaction is a book that explores the interaction between people and technology, in the broader context of the relations between the human made and the natural environments. It is not just about digital technologies - our computers, smart phones, the Internet - but all our technologies such as mechanical, electrical and electronic. Our ancestors started creating mechanical tools and shaping their environments millions of years ago, developing cultures and languages, which in turn influenced our evolution. Volume 1 of Understanding Interaction looks into this deep history - starting from the tool creating period (the longest and most influential on our physical and mental capacities), to the settlement period (agriculture, domestication, villages and cities, written language), the industrial period (science, engineering, reformation and renaissance), and finally the communication period (mass media, digital technologies, global networks). Volume 2 looks into humans in interaction - our physiology, anatomy, neurology, psychology, how we experience and influence the world, and how we (think we) think. From this transdisciplinary understanding, design approaches and frameworks are presented, to potentially guide future developments and innovations. The aim of the book is to be guide and inspiration for designers, artists, engineers, psychologists, media producers, social scientists etc., and as such be useful for both novices and more experienced practitioners.

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**higher algebra kurosh: Multiforms, Dyadics, and Electromagnetic Media** Ismo V. Lindell, 2015-02-18 This book applies the four-dimensional formalism with an extended toolbox of operation rules, allowing readers to define more general classes of electromagnetic media and to analyze EM waves that can exist in them End-of-chapter exercises Formalism allows readers to find novel classes of media Covers various properties of electromagnetic media in terms of which they can be set in different classes

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**higher algebra kurosh: Operations Research in Transportation Systems** A.S. Belenky, 2013-06-29 The scientific monograph of a survey kind presented to the reader's attention deals with fundamental ideas and basic schemes of optimization methods that can be effectively used for solving strategic planning and operations management problems related, in particular, to transportation. This monograph is an English translation of a considerable part of the author's book with a similar title that was published in Russian in 1992. The material of the monograph embraces

methods of linear and nonlinear programming; nonsmooth and nonconvex optimization; integer programming, solving problems on graphs, and solving problems with mixed variables; routing, scheduling, solving network flow problems, and solving the transportation problem; stochastic programming, multicriteria optimization, game theory, and optimization on fuzzy sets and under fuzzy goals; optimal control of systems described by ordinary differential equations, partial differential equations, generalized differential equations (differential inclusions), and functional equations with a variable that can assume only discrete values; and some other methods that are based on or adjoin to the listed ones.

**higher algebra kurosh: Discrete Harmonic Analysis** Tullio Ceccherini-Silberstein, Fabio Scarabotti, Filippo Tolli, 2018-05-31 This self-contained book introduces readers to discrete harmonic analysis with an emphasis on the Discrete Fourier Transform and the Fast Fourier Transform on finite groups and finite fields, as well as their noncommutative versions. It also features applications to number theory, graph theory, and representation theory of finite groups. Beginning with elementary material on algebra and number theory, the book then delves into advanced topics from the frontiers of current research, including spectral analysis of the DFT, spectral graph theory and expanders, representation theory of finite groups and multiplicity-free triples, Tao's uncertainty principle for cyclic groups, harmonic analysis on  $GL(2, \mathbb{F}_q)$ , and applications of the Heisenberg group to DFT and FFT. With numerous examples, figures, and over 160 exercises to aid understanding, this book will be a valuable reference for graduate students and researchers in mathematics, engineering, and computer science.

**higher algebra kurosh: Computational Methods in Bifurcation Theory and Dissipative Structures** M. Kubicek, M. Marek, 2012-12-06 Dissipative structures is a concept which has recently been used in physics to discuss the formation of structures organized in space and/or time at the expense of the energy flowing into the system from the outside. The space-time structural organization of biological systems starting from the subcellular level up to the level of ecological systems, coherent structures in laser and of elastic stability in mechanics, instability in hydro plasma physics, problems dynamics leading to the development of turbulence, behavior of electrical networks and chemical reactors form just a short list of problems treated in this framework. Mathematical models constructed to describe these systems are usually nonlinear, often formed by complicated systems of algebraic, ordinary differential, or partial differential equations and include a number of characteristic parameters. In problems of theoretical interest as well as engineering practice, we are concerned with the dependence of solutions on parameters and particularly with the values of parameters where qualitatively new types of solutions, e.g., oscillatory solutions, new stationary states, and chaotic attractors, appear (bifurcate). Numerical techniques to determine both bifurcation points and the dependence of steady-state and oscillatory solutions on parameters are developed and discussed in detail in this text. The text is intended to serve as a working manual not only for students and research workers who are interested in dissipative structures, but also for practicing engineers who deal with the problems of constructing models and solving complicated nonlinear systems.

**higher algebra kurosh: The Discrete Math Workbook** Sergei Kurgalin, Sergei Borzunov, 2018-07-31 This practically-oriented textbook presents an accessible introduction to discrete mathematics through a substantial collection of classroom-tested exercises. Each chapter opens with concise coverage of the theory underlying the topic, reviewing the basic concepts and establishing the terminology, as well as providing the key formulae and instructions on their use. This is then followed by a detailed account of the most common problems in the area, before the reader is invited to practice solving such problems for themselves through a varied series of questions and assignments. Topics and features: provides an extensive set of exercises and examples of varying levels of complexity, suitable for both laboratory practical training and self-study; offers detailed solutions to many problems, applying commonly-used methods and computational schemes; introduces the fundamentals of mathematical logic, the theory of algorithms, Boolean algebra, graph theory, sets, relations, functions, and combinatorics; presents more advanced material on the design

and analysis of algorithms, including asymptotic analysis, and parallel algorithms; includes reference lists of trigonometric and finite summation formulae in an appendix, together with basic rules for differential and integral calculus. This hands-on study guide is designed to address the core needs of undergraduate students training in computer science, informatics, and electronic engineering, emphasizing the skills required to develop and implement an algorithm in a specific programming language.

**higher algebra kurosh:** *Canadian Mathematical Bulletin* , 1963

**higher algebra kurosh: Encyclopaedia of Mathematics** Michiel Hazewinkel, 2012-12-06

This ENCYCLOPAEDIA OF MATHEMATICS aims to be a reference work for all parts of mathematics. It is a translation with updates and editorial comments of the Soviet Mathematical Encyclopaedia published by 'Soviet Encyclopaedia Publishing House' in five volumes in 1977-1985. The annotated translation consists of ten volumes including a special index volume. There are three kinds of articles in this ENCYCLOPAEDIA. First of all there are survey-type articles dealing with the various main directions in mathematics (where a rather fine subdivision has been used). The main requirement for these articles has been that they should give a reasonably complete up-to-date account of the current state of affairs in these areas and that they should be maximally accessible. On the whole, these articles should be understandable to mathematics students in their first specialization years, to graduates from other mathematical areas and, depending on the specific subject, to specialists in other domains of science, engineers and teachers of mathematics. These articles treat their material at a fairly general level and aim to give an idea of the kind of problems, techniques and concepts involved in the area in question. They also contain background and motivation rather than precise statements of precise theorems with detailed definitions and technical details on how to carry out proofs and constructions. The second kind of article, of medium length, contains more detailed concrete problems, results and techniques.

**higher algebra kurosh:** *Encyclopaedia of Mathematics* M. Hazewinkel, 2013-12-01

**higher algebra kurosh: Counting and Configurations** Jiri Herman, Radan Kucera, Jaromir Simsa, 2013-03-14 This book can be seen as a continuation of *Equations and Inequalities: Elementary Problems and Theorems in Algebra and Number Theory* by the same authors, and published as the first volume in this book series. However, it can be independently read or used as a textbook in its own right. This book is intended as a text for a problem-solving course at the first or second-year university level, as a text for enrichment classes for talented high-school students, or for mathematics competition training. It can also be used as a source of supplementary material for any course dealing with combinatorics, graph theory, number theory, or geometry, or for any of the discrete mathematics courses that are offered at most American and Canadian universities. The underlying philosophy of this book is the same as that of *Equations and Inequalities*. The following paragraphs are therefore taken from the preface of that book.

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