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***The International Mathematical Olympiad (IMO) is an annual international mathematics competition held for pre-collegiate students. It is also the oldest of the international science olympiads, and competition for places is particularly fierce. This book is an amalgamation of the booklets originally produced to guide students intending to***

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*contend for placement on their country's IMO team. See also A First Step to Mathematical Olympiad Problems which was published in 2009. The material contained in this book provides an introduction to the main mathematical topics covered in the IMO, which are: Combinatorics, Geometry and Number Theory. In addition, there is a special emphasis on how to approach unseen questions in Mathematics, and model the writing of proofs. Full answers are given to all questions. Though A Second Step to Mathematical Olympiad Problems is written from the perspective of a mathematician, it*

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*is written in a way that makes it easily comprehensible to adolescents. This book is also a must-read for coaches and instructors of mathematical competitions.*

*"The IMO Compendium" is the ultimate collection of challenging high-school-level mathematics problems and is an invaluable resource not only for high-school students preparing for mathematics competitions, but for anyone who loves and appreciates mathematics. The International Mathematical Olympiad (IMO), nearing its 50th anniversary, has become the most popular and prestigious competition for high-school students*

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*interested in mathematics. Only six students from each participating country are given the honor of participating in this competition every year. The IMO represents not only a great opportunity to tackle interesting and challenging mathematics problems, it also offers a way for high school students to measure up with students from the rest of the world. Until the first edition of this book appearing in 2006, it has been almost impossible to obtain a complete collection of the problems proposed at the IMO in book form. "The IMO Compendium" is the result of a collaboration between four former IMO*

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*participants from Yugoslavia, now Serbia and Montenegro, to rescue these problems from old and scattered manuscripts, and produce the ultimate source of IMO practice problems. This book attempts to gather all the problems and solutions appearing on the IMO through 2009. This second edition contains 143 new problems, picking up where the 1959–2004 edition has left off.*

*Olympiad mathematics is not a collection of techniques of solving mathematical problems but a system for advancing mathematical education. This book is based on the lecture notes of the mathematical Olympiad training*

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*courses conducted by the author in Singapore. Its scope and depth not only covers and exceeds the usual syllabus, but introduces a variety concepts and methods in modern mathematics. In each lecture, the concepts, theories and methods are taken as the core. The examples are served to explain and enrich their intension and to indicate their applications. Besides, appropriate number of test questions is available for reader's practice and testing purpose. Their detailed solutions are also conveniently provided. The examples are not very complicated so that readers can easily understand. There are many*

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*real competition questions included which students can use to verify their abilities. These test questions are from many countries, e.g. China, Russia, USA, Singapore, etc. In particular, the reader can find many questions from China, if he is interested in understanding mathematical Olympiad in China. This book serves as a useful textbook of mathematical Olympiad courses, or as a reference book for related teachers and researchers. Errata(s). Errata. Sample Chapter(s). Lecture 1: Operations on Rational Numbers (145k). Request Inspection Copy. Contents: .. Operations on Rational Numbers;*

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*Linear Equations of Single Variable; Multiplication Formulae; Absolute Value and Its Applications; Congruence of Triangles; Similarity of Triangles; Divisions of Polynomials; Solutions to Testing Questions; and other chapters. Readership: Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts*

*The International Mathematical Olympiad (IMO) is a competition for high school students. China has taken part in the IMO 21 times since 1985 and has won the top ranking for countries 14 times, with a multitude of golds*



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*for individual students. The six students China has sent every year were selected from 20 to 30 students among approximately 130 students who took part in the annual China Mathematical Competition during the winter months. This volume comprises a collection of original problems with solutions that China used to train their Olympiad team in the years from 2006 to 2008. Mathematical Olympiad problems with solutions for the years 2002-2006 appear in an earlier volume, Mathematical Olympiad in China. Problem-Solving and Selected Topics in Euclidean Geometry*

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*Mathematical Olympiads 1999–2000*

*How to Navigate Clueless Colleagues, Lunch-Stealing Bosses, and the Rest of Your Life at Work*

*A First Step to Mathematical Olympiad Problems*

*Bridge to Higher Mathematics*

*Mathematical Olympiad Treasures*

This brief sheds light on evolving drug markets and the county lines phenomenon in the British context. Drawing upon empirical research gathered in the field between 2012–2019 across two sites, Scotland's West Coast and Merseyside in England, this book

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adopts a grounded approach to the drug supply model, detailing how drugs are purchased, sold and distributed at every level of the supply chain at both sites. The authors conducted interviews with practitioners, offenders, ex-offenders and those members of the general public most effected by organised crime. The research explores how drug markets have continued to evolve, accumulating in the phenomenon that is county lines. It explores how such behavior has gradually become ever more intertwined with other forms of organised criminal activity. Useful for researchers, policy makers, and law

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enforcement officials, this brief recommends a rethinking of current reactive policing strategies.

A collection of problems put together by coaches of the U.S. International Mathematical Olympiad Team.

Contained here are solutions to challenging problems from algebra, geometry, combinatorics and number theory featured in the earlier book, together with selected questions (without solutions) from national and regional Olympiads given during the year 2000. Intended for the serious student/problem solver, these books can help

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to improve performance in the Mathematical Olympiad competition. However, for those not entering the competition, there is much to challenge any mathematician, even those with advanced degrees. Different nations have different mathematical cultures, so you will find that some of the questions are extremely difficult and some rather easy. There are a wide variety of problems especially from those countries that have often done well in the IMO. Anyone interested in mathematical problem solving will encounter some beautiful mathematics in the pages of this book. If you are up to a real challenge, take some of

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these problems on!

The book contains problems from the first 32 British Mathematical Olympiad (BMO) papers 1965–96 and gives hints and outline solutions to each problem from 1975 onwards. An overview is given of the basic mathematical skills needed, and a list of books for further reading is provided. Working through the exercises provides a valuable source of extension and enrichment for all pupils and adults interested in mathematics.

from the Polish Mathematical Olympiads  
Problems and Solutions  
Mathematics via Problems

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A Collection of Problems Suggested for The International Mathematical Olympiads:  
1959–2009 Second Edition

First Steps for Math Olympians: Using the American Mathematics Competitions

From the Training of the USA IMO Team

**Annotation.** This text 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.

This book takes the reader on a journey through

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the world of college mathematics, focusing on some of the most important concepts and results in the theories of polynomials, linear algebra, real analysis, differential equations, coordinate geometry, trigonometry, elementary number theory, combinatorics, and probability.

Preliminary material provides an overview of common methods of proof: argument by contradiction, mathematical induction, pigeonhole principle, ordered sets, and invariants. Each chapter systematically presents a single subject within which problems are clustered in each section according to the specific topic. The



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exposition is driven by nearly 1300 problems and examples chosen from numerous sources from around the world; many original contributions come from the authors. The source, author, and historical background are cited whenever possible. Complete solutions to all problems are given at the end of the book. This second edition includes new sections on quadratic polynomials, curves in the plane, quadratic fields, combinatorics of numbers, and graph theory, and added problems or theoretical expansion of sections on polynomials, matrices, abstract algebra, limits of sequences and functions,

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derivatives and their applications, Stokes' theorem, analytical geometry, combinatorial geometry, and counting strategies. Using the W.L. Putnam Mathematical Competition for undergraduates as an inspiring symbol to build an appropriate math background for graduate studies in pure or applied mathematics, the reader is eased into transitioning from problem-solving at the high school level to the university and beyond, that is, to mathematical research. This work may be used as a study guide for the Putnam exam, as a text for many different problem-solving courses, and as a source of

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problems for standard courses in undergraduate mathematics. Putnam and Beyond is organized for independent study by undergraduate and graduate students, as well as teachers and researchers in the physical sciences who wish to expand their mathematical horizons.

Popular Lectures in Mathematics, Volume 12: Mathematical Problems and Puzzles: From the Polish Mathematical Olympiads contains sample problems from various fields of mathematics, including arithmetic, algebra, geometry, and trigonometry. The contest for secondary school pupils known as the Mathematical Olympiad has

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been held in Poland every year since 1949/50. This book is composed of two main parts. Part I considers the problems and solutions about integers, polynomials, algebraic fractions and irrational experience. Part II focuses on the problems of geometry and trigonometric transformation, along with their solutions. The provided solutions aim to extend the student's knowledge of mathematics and train them in mathematical thinking. This book will prove useful to secondary school mathematics teachers and students.

Now in its Second Edition, Introduction to Gifted

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Education presents a well-researched yet accessible introduction to gifted education, focusing on equity and supporting diverse learners. Inclusive in nature, this essential text is filled with varied perspectives and approaches to the critical topics and issues affecting gifted education. Chapters cover topics such as gifted education standards, social-emotional needs, cognitive development, diverse learners, identification, programming options, creativity, professional development, and curriculum. The book provides a comprehensive look at each topic, including an overview of big ideas, its

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history, and a thorough discussion to help those new to the field gain a better understanding of gifted students and strategies to address their needs. Filled with rich resources to engage readers in their own learning, *Introduction to Gifted Education, Second Edition* is the definitive textbook for courses introducing teachers to gifted education.

Developing Math Talent

Lecture Notes on Mathematical Olympiad Courses  
The First Ten Years

Mathematical Olympiad Challenges

In the Spirit of the Mathematical Olympiads

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Division E and Division M Contests from school years 2005/06 through 2012/13.

Curriculum compacting allows learners to move successfully through the curriculum at their own pace. This book focuses on the nuts and bolts of this effective method for differentiating classroom content, process skills, and creative products of gifted learners. In this concise introduction, Dr. Sally M. Reis and Joseph S. Renzulli discuss the research on curriculum compacting and the steps employed in implementing it in any classroom. Case studies of its effectiveness on schoolwide enrichment are also included. This is one of the books in Prufrock Press' popular Practical Strategies Series in Gifted Education. This series offers a unique collection of tightly focused books that

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provide a concise, practical introduction to important topics concerning the education of gifted children. The guides offer a perfect beginner's introduction to key information about gifted and talented education. Educational Resource This is a book on Olympiad Mathematics with detailed and elegant solution of each problem. This book will be helpful for all the students preparing for RMO, INMO, IMO, ISI and other National & International Mathematics competitions. The beauty of this book is it contains “ Original Problems ” framed by authors Daniel Sitaru( Editor-In-Chief of Romanian Mathematical Magazine) & Rajeev Rastogi (Senior Maths Faculty for IIT-JEE and Olympiad in Kota, Rajasthan) MOEMS® Contest Problems



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Principles and Techniques in Combinatorics

Winning Solutions

Math Storm Olympiad Problems

Criminal Networks and Evolving Drug Markets in Britain

A Guide for Educating Gifted and Advanced Learners in Math

Combinatorial Problems in Mathematical Competitions

*Mathematical circles, with their question-driven approach and emphasis on problem solving, expose students to the type of mathematics that stimulates the development of logical thinking, creativity, analytical abilities, and mathematical reasoning. These skills, while scarcely introduced*

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*at school, are in high demand in the modern world. This book, a sequel to Mathematical Circle Diaries, Year 1, teaches how to think and solve problems in mathematics. The material, distributed among twenty-nine weekly lessons, includes detailed lectures and discussions, sets of problems with solutions, and contests and games. In addition, the book shares some of the know-how of running a mathematical circle. The book covers a broad range of problem-solving strategies and proofing techniques, as well as some more advanced topics that go beyond the limits of a school curriculum. The topics include*

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*invariants, proofs by contradiction, the Pigeonhole principle, proofs by coloring, double counting, combinatorics, binary numbers, graph theory, divisibility and remainders, logic, and many others. When students take science and computing classes in high school and college, they will be better prepared for both the foundations and advanced material. The book contains everything that is needed to run a successful mathematical circle for a full year. This book, written by an author actively involved in teaching mathematical circles for fifteen years, is intended for teachers, math coaches,*

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*parents, and math enthusiasts who are interested in teaching math that promotes critical thinking. Motivated students can work through this book on their own. In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday life, MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people, their parents and teachers, and the mathematics profession.*

*A textbook suitable for undergraduate courses. The materials are presented very explicitly so*

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*that students will find it very easy to read. A wide range of examples, about 500 combinatorial problems taken from various mathematical competitions and exercises are also included. A unique collection of competition problems from over twenty major national and international mathematical competitions for high school students. Written for trainers and participants of contests of all levels up to the highest level, this will appeal to high school teachers conducting a mathematics club who need a range of simple to complex problems and to those instructors wishing to pose a "problem of the week", thus*

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*bringing a creative atmosphere into the classrooms. Equally, this is a must-have for individuals interested in solving difficult and challenging problems. Each chapter starts with typical examples illustrating the central concepts and is followed by a number of carefully selected problems and their solutions. Most of the solutions are complete, but some merely point to the road leading to the final solution. In addition to being a valuable resource of mathematical problems and solution strategies, this is the most complete training book on the market.*

*This book is a translation from Russian of Part I*

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*of the book Mathematics Through Problems: From Olympiads and Math Circles to Profession. The other two parts, Geometry and Combinatorics, will be published soon. The main goal of this book is to develop important parts of mathematics through problems. The author tries to put together sequences of problems that allow high school students (and some undergraduates) with strong interest in mathematics to discover and recreate much of elementary mathematics and start edging into the sophisticated world of topics such as group theory, Galois theory, and so on, thus building a bridge (by showing that*

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*there is no gap) between standard high school exercises and more intricate and abstract concepts in mathematics. Definitions and/or references for material that is not standard in the school curriculum are included. However, many topics in the book are difficult when you start learning them from scratch. To help with this, problems are carefully arranged to provide gradual introduction into each subject. Problems are often accompanied by hints and/or complete solutions The book is based on classes taught by the author at different times at the Independent University of Moscow, at a number of Moscow*



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*schools and math circles, and at various summer schools. It can be used by high school students and undergraduates, their teachers, and organizers of summer camps and math circles. In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday life, MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people, their parents and teachers, and the mathematics profession.*

*County Lines*

*Mathematical Circle Diaries, Year 2: Complete*

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*Curriculum for Grades 6 to 8  
Selected Problems and Theorems of Elementary  
Mathematics*

*For Junior Section*

*103 Trigonometry Problems*

*Maths Olympiad Contest Problems*

**This engaging math textbook is designed to equip students who have completed a standard high school math curriculum with the tools and techniques that they will need to succeed in upper level math courses. Topics covered include logic and set theory, proof techniques, number theory, counting, induction, relations, functions, and cardinality.**

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**"Problem-Solving and Selected Topics in Euclidean Geometry: in the Spirit of the Mathematical Olympiads"** contains theorems which are of particular value for the solution of geometrical problems. Emphasis is given in the discussion of a variety of methods, which play a significant role for the solution of problems in Euclidean Geometry. Before the complete solution of every problem, a key idea is presented so that the reader will be able to provide the solution. Applications of the basic geometrical methods which include analysis, synthesis, construction and proof are given. Selected problems which have been given in mathematical olympiads or proposed in short lists in IMO's are discussed. In addition, a number of problems proposed by leading

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mathematicians in the subject are included here. The book also contains new problems with their solutions. The scope of the publication of the present book is to teach mathematical thinking through Geometry and to provide inspiration for both students and teachers to formulate "positive" conjectures and provide solutions. From the creator of the popular website Ask a Manager and New York's work-advice columnist comes a witty, practical guide to 200 difficult professional conversations—featuring all-new advice! There's a reason Alison Green has been called "the Dear Abby of the work world." Ten years as a workplace-advice columnist have taught her that people avoid awkward conversations in the office because they simply don't

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**know what to say. Thankfully, Green does—and in this incredibly helpful book, she tackles the tough discussions you may need to have during your career. You'll learn what to say when • coworkers push their work on you—then take credit for it • you accidentally trash-talk someone in an email then hit “reply all” • you're being micromanaged—or not being managed at all • you catch a colleague in a lie • your boss seems unhappy with your work • your cubemate's loud speakerphone is making you homicidal • you got drunk at the holiday party Praise for Ask a Manager “A must-read for anyone who works . . . [Alison Green's] advice boils down to the idea that you should be professional (even when others are not) and that communicating in a**

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**straightforward manner with candor and kindness will get you far, no matter where you work.”—Booklist (starred review) “The author’s friendly, warm, no-nonsense writing is a pleasure to read, and her advice can be widely applied to relationships in all areas of readers’ lives. Ideal for anyone new to the job market or new to management, or anyone hoping to improve their work experience.”—Library Journal (starred review) “I am a huge fan of Alison Green’s Ask a Manager column. This book is even better. It teaches us how to deal with many of the most vexing big and little problems in our workplaces—and to do so with grace, confidence, and a sense of humor.”—Robert Sutton, Stanford professor and author of The No Asshole Rule and The Asshole**

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**Survival Guide “Ask a Manager is the ultimate playbook for navigating the traditional workforce in a diplomatic but firm way.”—Erin Lowry, author of Broke Millennial: Stop Scraping By and Get Your Financial Life Together**

**The techniques presented here are useful for solving mathematical contest problems in algebra and analysis. Most of the examples and exercises that appear in the book originate from mathematical Olympiad competitions around the world. In the first four chapters the authors cover material for competitions at high school level. The level advances with the chapters. The topics explored include polynomials, functional equations, sequences and an elementary treatment of complex numbers. The final chapters provide a**

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**comprehensive list of problems posed at national and international contests in recent years, and solutions to all exercises and problems presented in the book. It helps students in preparing for national and international mathematical contests form high school level to more advanced competitions and will also be useful for their first year of mathematical studies at the university. It will be of interest to teachers in college and university level, and trainers of the mathematical Olympiads.**

**Mathematical Problems and Puzzles**

**Curriculum Compacting**

**Part 1: Algebra**

**The IMO Compendium**



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## Counting Strategies

Mathematical Olympiad in China (2007-2008)

*\* Problem-solving tactics and practical test-taking techniques provide in-depth enrichment and preparation for various math competitions \**

*Comprehensive introduction to trigonometric functions, their relations and functional properties, and their applications in the Euclidean plane and solid geometry \* A cogent problem-solving resource for advanced high school students, undergraduates, and mathematics teachers engaged in competition training*

**See also A SECOND STEP TO MATHEMATICAL**

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***OLYMPIAD PROBLEMS*** *The International Mathematical Olympiad (IMO) is an annual international mathematics competition held for pre-collegiate students. It is also the oldest of the international science olympiads, and competition for places is particularly fierce. This book is an amalgamation of the first 8 of 15 booklets originally produced to guide students intending to contend for placement on their country's IMO team. The material contained in this book provides an introduction to the main mathematical topics covered in the IMO, which are: Combinatorics, Geometry and Number Theory. In addition, there is a special emphasis on*

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***how to approach unseen questions in Mathematics, and model the writing of proofs. Full answers are given to all questions. Though A First Step to Mathematical Olympiad Problems is written from the perspective of a mathematician, it is written in a way that makes it easily comprehensible to adolescents. This book is also a must-read for coaches and instructors of mathematical competitions. This unique book presents mathematical competition problems primarily aimed at upper elementary school students, but are challenging for students at any age. These problems are drawn from the complete papers of the legendary Leningrad***

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***Mathematical Olympiads that were presented to the city's Grade Five students. The period covered is between 1979 – the earliest year for which relevant records could be retrieved – and 1992, when the former Soviet Union was dissolved. The respective chapters reflect the famous four-step approach to problem solving developed by the great Hungarian mathematics educator Gyorgy Pólya. In Chapter One, the Grade Five Competition problems from the Leningrad Mathematical Olympiads from 1979 to 1992 are presented in chronological order. In Chapter Two, the 83 problems are loosely divided into 26 sets of three or four related problems, and an***

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***example is provided for each one. Chapter Three provides full solutions to all problems, while Chapter Four offers generalizations of the problems. This book can be used by any mathematically advanced student at the upper elementary school level.***

***Teachers and organizers of outreach activities such as mathematical circles will also find this book useful. But the primary value of the book lies in the problems themselves, which were crafted by experts; therefore, anyone interested in problem solving will find this book a welcome addition to their library./div***

***The series is edited by the head coaches of China's***

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***IMO National Team. Each volume, catering to different grades, is contributed by the senior coaches of the IMO National Team. The Chinese edition has won the award of Top 50 most influential educational brand in China. The series is in line with the mathematics cognition and intellectual development level of the students in the corresponding grade. The volume lines up the topics in each chapter and introduces a variety of concepts and methods to provide with the knowledge, then gradually transitions to the competition level. The content covers all the hot topics of the competition. In each chapter, there are packed with many***

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***problems including some real competition questions which students can use to verify their abilities.***

***Selected detailed answers are provided. Some of the solutions are from national training team and national team members, their wonderful solutions being the feature of this series.***

***An Easy Start to Differentiating for High-potential Students***

***Topics in Algebra and Analysis***

***Creative Problem Solving in School Mathematics***

***An Introduction to Problem Solving Based on the First 32 British Mathematical Olympiads 1965-1996***

***Ask a Manager***

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### ***Math Olympiad Contest Problems for Elementary and Middle Schools***

*This unique approach to combinatorics is centered around unconventional, essay-type combinatorial examples, followed by a number of carefully selected, challenging problems and extensive discussions of their solutions. Topics encompass permutations and combinations, binomial coefficients and their applications, bijections, inclusions and exclusions, and generating functions. Each chapter features fully-worked problems, including many from Olympiads and other competitions, as well as a number of problems original to the authors; at the end of each chapter are*



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*further exercises to reinforce understanding, encourage creativity, and build a repertory of problem-solving techniques. The authors' previous text, "102 Combinatorial Problems," makes a fine companion volume to the present work, which is ideal for Olympiad participants and coaches, advanced high school students, undergraduates, and college instructors. The book's unusual problems and examples will interest seasoned mathematicians as well. "A Path to Combinatorics for Undergraduates" is a lively introduction not only to combinatorics, but to mathematical ingenuity, rigor, and the joy of solving puzzles.*

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*Any high school student preparing for the American Mathematics Competitions should get their hands on a copy of this book! A major aspect of mathematical training and its benefit to society is the ability to use logic to solve problems. The American Mathematics Competitions (AMC) have been given for more than fifty years to millions of high school students. This book considers the basic ideas behind the solutions to the majority of these problems, and presents examples and exercises from past exams to illustrate the concepts. Anyone taking the AMC exams or helping students prepare for them will find many useful ideas here. But people generally interested in logical problem solving*

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*should also find the problems and their solutions interesting. This book will promote interest in mathematics by providing students with the tools to attack problems that occur on mathematical problem-solving exams, and specifically to level the playing field for those who do not have access to the enrichment programs that are common at the top academic high schools. The book can be used either for self-study or to give people who want to help students prepare for mathematics exams easy access to topic-oriented material and samples of problems based on that material. This is useful for teachers who want to hold special sessions for students, but it is equally valuable*

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*for parents who have children with mathematical interest and ability. As students' problem solving abilities improve, they will be able to comprehend more difficult concepts requiring greater mathematical ingenuity. They will be taking their first steps towards becoming math Olympians!*

*This book provides the mathematical tools and problem-solving experience needed to successfully compete in high-level problem solving competitions. Each section presents important background information and then provides a variety of worked examples and exercises to help bridge the gap between what the reader may already know and what is required for high-level*

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*competitions. Answers or sketches of the solutions are given for all exercises.*

*Build student success in math with the only comprehensive parent and teacher guide for developing math talent among advanced learners. The authors, nationally recognized math education experts, offer a focused look at educating gifted and talented students for success in math. More than just a guidebook for educators and parents, this book offers a comprehensive approach to mathematics education for gifted students of elementary or middle school age. The authors provide concrete suggestions for identifying mathematically talented students, tools for*

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*instructional planning, and specific programming approaches. Developing Math Talent features topics such as: strategies for identifying mathematically gifted learners, strategies for advocating for gifted children with math talent, how to design a systematic math education program for gifted students, specific curricula and materials that support success, and teaching strategies and approaches that encourage and challenge gifted learners. The book also includes an extensive listing of both print and Internet resources that support math education for talented children. Additionally, the authors include an entire section featuring exemplary sets of challenging math problems*

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*for gifted students.*

*MOEMS® Contest Problems*

*The Mathematical Olympiad Handbook*

*The USSR Olympiad Problem Book*

*Math Olympiad Contest Problems*

*Competition Math for Middle School*

*Problems and Solutions in Mathematical Olympiad  
(High School 3)*

This book is a comprehensive compilation of all the problems and solutions from the 2003 to 2012 Purple Comet Math Meet contests for middle and high school students. The problems featured not only employ an extensive range of mathematical concepts from algebra,

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geometry, number theory, and combinatorics but also encourage team collaboration. Any student interested in mathematics--whether looking to prepare for contests or, even more importantly, to sharpen math problem-solving skills--would cherish and enjoy this unique and pertinent collection of meaningful problems and solutions.

Over 300 challenging problems in algebra, arithmetic, elementary number theory and trigonometry, selected from Mathematical Olympiads held at Moscow University. Only high school math needed. Includes complete solutions. Features 27 black-and-white illustrations. 1962 edition.

This is a challenging problem-solving book in Euclidean geometry, assuming nothing of the reader other than a



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good deal of courage. Topics covered included cyclic quadrilaterals, power of a point, homothety, triangle centers; along the way the reader will meet such classical gems as the nine-point circle, the Simson line, the symmedian and the mixtilinear incircle, as well as the theorems of Euler, Ceva, Menelaus, and Pascal. Another part is dedicated to the use of complex numbers and barycentric coordinates, granting the reader both a traditional and computational viewpoint of the material. The final part consists of some more advanced topics, such as inversion in the plane, the cross ratio and projective transformations, and the theory of the complete quadrilateral. The exposition is friendly and relaxed, and accompanied by over 300 beautifully drawn

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figures. The emphasis of this book is placed squarely on the problems. Each chapter contains carefully chosen worked examples, which explain not only the solutions to the problems but also describe in close detail how one would invent the solution to begin with. The text contains a selection of 300 practice problems of varying difficulty from contests around the world, with extensive hints and selected solutions. This book is especially suitable for students preparing for national or international mathematical olympiads or for teachers looking for a text for an honor class.

Mathematical Olympiad Treasures aims at building a bridge between ordinary high school exercises and more sophisticated, intricate and abstract concepts in

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undergraduate mathematics. The book contains a stimulating collection of problems in the subjects of algebra, geometry, trigonometry, number theory and combinatorics. While it may be considered a sequel to "Mathematical Olympiad Challenges," the focus is on engaging a wider audience to apply techniques and strategies to real-world problems. Throughout the book students are encouraged to express their ideas, conjectures, and conclusions in writing. The goal is to help readers develop a host of new mathematical tools that will be useful beyond the classroom and in a number of disciplines.

A Second Step to Mathematical Olympiad Problems  
Problem-Solving Strategies

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