

Mathematical Olympiad In China 2011 2014

The Moscow Mathematical Olympiad has been challenging high school students with stimulating, original problems of different degrees of difficulty for over 75 years. The problems are nonstandard: solving them takes wit, thinking outside the box, and, sometimes, hours of contemplation. Some are within the reach of most mathematically competent high school students, while others are difficult even for a mathematics professor. Many mathematically inclined students have found tackling these problems, or even just reading their solutions, is a great way to develop mathematical insight. In 2006 the Moscow Center for Continuous Mathematical Education began publishing a collection of problems from the Moscow Mathematical Olympiads, providing for each an answer (and sometimes a hint) as well as one or more detailed solutions. This volume represents the years 1993-1999. The problems and the accompanying material are well suited for math circles and also appropriate for problem-solving classes and practice for regional and national mathematics competitions. 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. Titles in this series are co-published with the Mathematical Sciences Research Institute (MSRI).

See also A SECOND STEP TO MATHEMATICAL 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 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 comprable to adolescents. This book is also a must-read for coaches and instructors of mathematical competitions.

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

Mathematical Olympiad In China (2011-2014): Problems And SolutionsWorld Scientific

This book discusses the merits and potential shortcomings of Hong Kong STEM education from Grade 8 to Grade 12. Based on concurrent triangulated mixed-method methodology, which integrates both quantitative and qualitative procedures, it describes various change models and proposes new models that are considered compatible with Western cultures.

This book critically explores why some Asian nations are on top of the world in students' achievement tests in reading and literacy, yet governments and industry in these nations are anxious about a crisis in education. Why are governments anxious about the capabilities and skills of school and university graduates in a global economy when there is a Asian economic boom? The authors explore questions about how the Asian countries value test-based examination curriculum and influence on the practices of teaching learning and the lives of young people in Asia. The authors describe the challenge of change for East Asian nations to develop more relevant approaches to literacy and language and more inclusive societies focussed on the needs of young people and not exam results.

In China, lots of excellent maths students take an active interest in various maths contests and the best six senior high school students will be selected to form the IMO National Team to compete in the International Mathematical Olympiad. In the past ten years China's IMO Team has achieved outstanding results — they won the first place almost every year. The authors are coaches of China's IMO National Team, whose students have won many gold medals many times in IMO. This book is part of the Mathematical Olympiad Series which discusses several aspects related to maths contests, such as algebra, number theory, combinatorics, graph theory and geometry. The book explains many basic techniques for proving inequalities such as direct comparison, method of magnifying and reducing, substitution method, construction method, and so on.

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 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 20020Co2006 appear in an earlier volume, Mathematical Olympiad in China."

Mathematical Olympiad In China (2007-2008)

Selected Regular Lectures from the 12th International Congress on Mathematical Education

Mathematical Olympiad Treasures

Combinatorial Problems in Mathematical Competitions

A Collection of Problems Suggested for The International Mathematical Olympiads: 1959-2004

Precision

Mathematical Olympiad In China (2011-2014): Problems And Solutions

50th IMO - 50 Years of International Mathematical Olympiads

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

Problem-Solving and Selected Topics in Number Theory

Lemmas in Olympiad Geometry

In China, lots of excellent maths students take an active interest in various maths contests and the best six senior high school students will be selected to form the IMO National Team to compete in the International Mathematical Olympiad. In the past ten years China's IMO Team has achieved outstanding results — they won the first place almost every year. The author is one of the coaches of China's IMO National Team, whose students have won many gold medals many times in IMO. This book is part of the Mathematical Olympiad Series which discusses several aspects related to maths contests, such as algebra, number theory, combinatorics, graph theory and geometry. The book elaborates on Geometric Inequality problems such as inequality for the inscribed quadrilateral, the area inequality for special polygons, linear geometric inequalities, etc. This volume provides a wide selection of problems (and solutions) to all those interested in mathematical problem solving and is accessible to readers from high school students to professionals. It is a resource for those interested in mathematical competitions ranging from high school level to the William Lowell Putnam Mathematical Competition (for undergraduate students). The collection offers challenges for students, teachers, and recreational mathematicians. Request Inspection Copy

In China, lots of excellent maths students takes an active part in various maths contests and the best six senior high school students will be selected to form the IMO National Team to compete in the International Mathematical Olympiad. In the past ten years, China's IMO Team has achieved outstanding results — they have won the first place almost every year.The author is one of the senior coaches of China's IMO National Team, he is the headmaster of Shanghai senior high school which is one of the best high schools of China. In the past decade, the students of this school have won the IMO gold medals almost every year.The author attempts to use some common characteristics of sequence and mathematical induction to fundamentally connect Math Olympiad problems to particular branches of mathematics. In doing so, the author hopes to reveal the beauty and joy involved with math exploration and at the same time, attempts to arouse readers' interest of learning math and invigorate their courage to challenge themselves with difficult problems.

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 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 of comprises a collection of original problems with solutions that China used to train their Olympiad team in the years from 2009 to 2010. Mathematical Olympiad problems with solutions for the years 20020Co2008 appear in an earlier volume, Mathematical Olympiad in China."

This book is part of the Mathematical Olympiad Series which discusses several aspects related to maths contests, such as algebra, number theory, combinatorics, graph theory and geometry. The book elaborates on methods of discrete extremization, such as inequality control, repeated extremum, partial adjustment, polishing transform, space estimates, etc. This volume provides a wide selection of problems (and solutions) to all those interested in mathematical problem solving and is accessible to readers from high school students to professionals. It is a resource for those interested in mathematical competitions ranging from high school level to the William Lowell Putnam Mathematical Competition (for undergraduate students). The collection offers challenges for students, teachers, and recreational mathematicians. Request Inspection Copy

This new volume of the Mathematical Olympiad Series focuses on the topic of geometry. Basic and advanced theorems commonly seen in Mathematical Olympiad are introduced and illustrated with plenty of examples. Special techniques in solving various types of geometrical problems are also introduced, while the authors elaborate extensively on how to acquire an insight and develop strategies in tackling difficult geometrical problems. This book is suitable for any reader with elementary geometrical knowledge at the lower secondary level. Each chapter includes sufficient scaffolding and is comprehensive enough for the purpose of self-study. Readers who complete the chapters on the basic theorems and techniques would acquire a good foundation in geometry and may attempt to solve many geometrical problems in various mathematical competitions. Meanwhile, experienced contestants in Mathematical Olympiad competitions will find a large collection of problems pitched at competitions at the international level, with opportunities to practise and sharpen their problem-solving skills in geometry.

In China, lots of excellent students who are good at maths takes an active part in various maths contests and the best six senior high school students will be selected to form the IMO National Team to compete in the International Mathematical Olympiad. In the past ten years China's IMO Team has achieved outstanding results — they have won the first place almost every year. The author is one of the coaches of China's IMO National Team, whose students have won many gold medals many times in IMO. This book is part of the Mathematical Olympiad Series which discusses several aspects related to maths contests, such as algebra, number theory, combinatorics, graph theory and geometry. The book elaborates on methods of discrete extremization, such as inequality control, repeated extremum, partial adjustment, polishing transform, space estimates, etc.

This book comprises the full selected Regular Lectures from the Proceedings of the 12th International Congress on Mathematical Education (ICME-12), which was held at COEX in Seoul, Korea, from July 8th to 15th, 2012. ICME-12 brought together 4700 experts from 100 countries, working to understand all of the intellectual and attitudinal challenges in the subject of mathematics education as a multidisciplinary research and practice. These selected Regular Lectures present the work of fifty-one prominent mathematics educators from all over the globe. The Lectures cover a wide spectrum of topics, themes and issues and aim to give direction to future research towards educational improvement in the teaching and learning of mathematics education. This book is of particular interest to researchers, teachers and curriculum developers in mathematics education.

Asian Indian Youth in South Asian Diaspora

Graph Theory

Selected Problems of the Vietnamese Mathematical Olympiad (1962-2009)

Making Mathematics Practical

Problems and Solutions

Insights and Strategies

The IMO Compendium

Solving Problems in Geometry

A Mathematical Olympiad Primer

Mathematical Olympiad in China (2011-2014)

Mathematical Olympiad in China (2011-2014)

Vietnam has actively organized the National Competition in Mathematics and since 1962, the Vietnamese Mathematical Olympiad (VMO). On the global stage, Vietnam has also competed in the International Mathematical Olympiad (IMO) since 1974 and constantly emerged as one of the top ten. To inspire and further challenge readers, we have gathered in this book selected problems of the VMO from 1962 to 2008. A number of Selection Test problems are also included to aid in the high school students and teachers, coaches and instructors preparing for mathematical olympiads, as well as non-experts simply interested in having the edge over their opponents in mathematical competitions.

"Precision ... Statistical and Mathematical Methods in Horse Racing" thoroughly discusses the mathematical and statistical methods in handicapping and betting techniques. Differentiations, combinatorics, normal distribution, kernel smoothing and other mathematical and statistical tools are introduced. The jargons and equations are kept to a minimum so that it is easy to understand for most readers. More than 20 professional programs are freely available to download, which can be divided into three main parts: horse handicapping (Chapters 2-6), wagering (Chapters 7-9) and theories in practices (Chapters 10-11). Chapter 1 will explain why long term gains are possible in horse racing. About horse handicapping, we will start with analysing racing forms in Chapter 2. Other handicapping factors such as weight carried, jockeys, trainers and pedigrees will be discussed in Chapter 3. Some advanced statistical methods, such as chi-square test and kernel test factors discussed in previous chapters. The following two chapters are about probability estimations. In Chapter 5, normal distribution and multinomial logistic regression are introduced in estimating winning probability of each race horse. In Chapter 6, we will talk about some methods in misconceptions in estimating placed probability. Two main concepts in wagering, Kelly criterion and hedging, will be discussed in Chapters 7 and 8. To hit exotic pools, those theories in combinatorial experiences in betting syndicate in Chapter 10, and tell you how to be a successful professional horseplayer in the last Chapter. Some readers may find the mathematics in this book difficult, but the free program will take your pain away and do all the calculations. You can simply apply all the professional formulae by no more than a click, and pick your horses like an expert analyst. As an awardee in Asian-Pacific Mathematics Olympiad, the author abandoned his career as an actual mathematician to become a professional horseplayer.

Though Asian Indians are typically thought of as a "model minority", not much is known about the school experiences of their children. Positive stereotyping of these immigrants and their children often masks educational needs and issues, creates class divides within the Indian-American community, and triggers stress for many Asian Indian students. This volume examines second generation (America-born) and 1.5 generation (foreign-born) Asian Indians as they try to balance peer pressure and academic achievement. The author examines how the process, these children either take advantage of this positive stereotype or refute their stereotyped ethnic image and move to downward mobility. Focusing on migrant experiences of the Indian diasporas in the United States, this volume brings attention to highly motivated Asian Indian students who are overlooked because of their cultural dispositions and outlooks on schooling, and those students who are more likely to underachieve. It highlights the assimilation of Asian Indian students into the American mainstream, and the role of inequality, diversity and multiculturalism.

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

This book showcases the synthetic problem-solving methods which frequently appear in modern day Olympiad geometry, in the way we believe they should be taught to someone with little familiarity in the subject. In some sense, the text also represents an unofficial sequel to the recent problem collection published by XYZ Press, 110 Geometry Problems for the International Mathematical Olympiad, written by the first and third authors, but the two books can be studied completely independently. Lemmas in classical geometry in a relatively linear fashion: gradually starting from Power of a Point and common results to more sophisticated topics, where knowing a lot of techniques can prove to be tremendously useful. We treat each chapter as a short story of its own and include numerous solved exercises with detailed explanations and related insights that will hopefully make your journey very enjoyable.

Low Attainers in Primary Mathematics focuses on data from students in Singapore schools. It is widely acknowledged that students from Singapore do well in mathematics in international studies. This book provides readers with a glimpse of students from Singapore who are at the other end of the ability spectrum. The book is based on a study that explored the mathematics content knowledge of Primary 4 low attainers in mathematics, their behaviours, affects and home background. The book also provides recommendations for teachers of low attainers in primary mathematics. This book serves as a must-have resource for teachers and graduate students in Singapore who are working with or studying low attainers in primary mathematics. It also makes a worthy contribution towards literature on low attainers in the field of mathematics education.

The Handbook of Education in China provides both a comprehensive overview and an original interpretation of key aspects of education in the People's Republic of China. It has four parts: The Historical Background; The Contemporary Chinese System: Problems and Policies; The Special Administrative Regions: Macau and Hong Kong. The Handbook is an essential reference for those interested in Chinese education: as well as a comprehensive textbook that provides valuable supplementary material for students of education and society more generally.

This is the ultimate collection of challenging high-school-level mathematics problems. It is the result of a two year long collaboration to rescue these problems from old and scattered manuscripts, and produce the definitive source of IMO practice problems in book form for the first time. This book attempts to gather all the problems and solutions appearing on the IMO and contains a grand total of 1900 problems. It is an invaluable resource for high-school students preparing for the International Mathematical Olympiad.

Handbook of Education in China

Fields Medalists' Lectures

The William Lowell Putnam Mathematical Competition 1985-2000: Problems, Solutions, and Commentary

Creating Change to Improve Science and Mathematics Education

Structure-Preserving Algorithms for Oscillatory Differential Equations

Mathematical Olympiad In China (2009-2010)

The Colorado Mathematical Olympiad and Further Explorations

Mathematics as Problem Solving

Statistical and Mathematical Methods in Horse Racing

Combinatorial Extremization

Adventures in Problem Solving

Various elementary techniques for solving problems in algebra, geometry, and combinatorics are explored in this second edition of Mathematics as Problem Solving. Each new chapter builds on the previous one, allowing the reader to uncover new methods for using logic to solve problems. Topics are presented in self-contained chapters, with classical solutions as well as Soifer's own discoveries. With roughly 200 different problems, the reader is challenged to approach problems from different angles. Mathematics as Problem Solving is aimed at students from high school through undergraduate levels and beyond, educators, and the general reader interested in the methods of mathematical problem solving.

This updated printing of the first edition of Colorado Mathematical Olympiad: the First Twenty Years and Further Explorations gives the interesting history of the competition as well as an outline of all the problems and solutions that have been created for the contest over the years. Many of the essay problems were inspired by Russian mathematical folklore and written to suit the young audience; for example, the 1989 Sugar problem was written in a pleasant Lewis Carroll-like story. Some other entertaining problems involve olde Victorian map colourings, King Authur and the knights of the round table, rooks in space, Santa Claus and his elves painting planes, football for 23, and even the Colorado Springs subway system.

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.

Structure-Preserving Algorithms for Oscillatory Differential Equations describes a large number of highly effective and efficient structure-preserving algorithms for second-order oscillatory differential equations by using theoretical analysis and numerical validation. Structure-preserving algorithms for differential equations, especially for oscillatory differential equations, play an important role in the accurate simulation of oscillatory problems in applied sciences and engineering. The book discusses novel advances in the ARKN, ERKN, two-step ERKN, Falkner-type and energy-preserving methods, etc. for oscillatory differential equations. The work is intended for scientists, engineers, teachers and students who are interested in structure-preserving algorithms for differential equations. Xinyuan Wu is a professor at Nanjing University; Xiong You is an associate professor at Nanjing Agricultural University; Bin Wang is a joint Ph.D student of Nanjing University and University of Cambridge.

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.

The book provides a self-contained introduction to classical Number Theory. All the proofs of the individual theorems and the solutions of the exercises are being presented step by step. Some historical remarks are also presented. The book will be directed to advanced undergraduate, beginning graduate students as well as to students who prepare for mathematical competitions (ex. Mathematical Olympiads and Putnam Mathematical competition).

Trouble in the Barker's Class

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 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 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.

Jim Totten's Problems of the Week

Literacy and Language in East Asia

A First Step to Mathematical Olympiad Problems

Moscow Mathematical Olympiads, 1983-1999

An Approach to Problem Solving

Methods and Techniques for Proving Inequalities

Lessons from Hong Kong

Problems of Number Theory in Mathematical Competitions

Geometric Inequalities

Sequences And Mathematical Induction:in Mathematical Olympiad And Competitions (2nd Edition)

In the Spirit of the Mathematical Olympiads

In July 2009 Germany hosted the 50th International Mathematical Olympiad (IMO). For the very first time the number of participating countries exceeded 100, with 104 countries from all continents. Celebrating the 50th anniversary of the IMO provides an ideal opportunity to look back over the past five decades and to review its development to become a worldwide event. This book is a report about the 50th IMO as well as the IMO history. A lot of data about all the 50 IMOs are included. We list the most successful contestants, the results of the 50 Olympiads and the 112 countries that have ever taken part. It is impressive to see that many of the world's leading research mathematicians were among the most successful IMO participants in their youth. Six of them gave presentations at a special celebration: Billlobás, Gowers, Lovász, Smirnov, Tao and Yoccoz. This book is aimed at students in the IMO age group and all those who have interest in this worldwide leading competition for highschool students.

This third volume of problems from the William Lowell Putnam Competition is unlike the previous two in that it places the problems in the context of important mathematical themes. The authors highlight connections to other problems, to the curriculum and to more advanced topics. The best problems contain kernels of sophisticated ideas related to important current research, and yet the problems are accessible to undergraduates. The solutions have been compiled from the American Mathematical Monthly, Mathematics Magazine and past competitors. Multiple solutions enhance the understanding of the audience, explaining techniques that have relevance to more than the problem at hand. In addition, the book contains suggestions for further reading, a hint to each problem, and separate from the full solution and background information about the competition. The book will appeal to students, teachers, professors and indeed anyone interested in problem solving as a gateway to a deep understanding of mathematics.

Although not as publicly well-known as the Nobel Prizes, the Fields Medal shares the same intellectual standing and is the equivalent award in the field of mathematics. This volume presents a selected list of 22 Fields Medalists and their contributions to give a highly interesting and varied bird's eye view of mathematics over the past 60 years. The contributions relate directly to the work for which the Medals were awarded or to the medalists' more current interests. In most cases, they are preceded by the introductory speech given by another leading mathematician during the prize ceremony, a photograph and up-to-date biographical notice.

The International Mathematical Olympiad (IMO) is a very important competition for high school students. China has taken part in the IMO 31 times since 1985 and has won the top ranking for countries 19 times, with a multitude of gold medals for individual students. The six students China has sent every year were selected from 60 students among approximately 300 students who took part in the annual China Mathematical Competition during the winter months.This book includes the problems and solutions of the most important mathematical competitions from 2010 to 2014 in China, such as China Mathematical Competition, China Mathematical Olympiad, China Girls' Mathematical Olympiad. These problems are almost exclusively created by the experts who are engaged in mathematical competition teaching and researching. Some of the solutions are from national training team and national team members, their wonderful solutions being the feature of this book. This book is useful to mathematics fans, middle school students engaged in mathematical competition, coaches in mathematics teaching and teachers setting up math elective courses.

"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 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 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.

Number theory is an important research field of mathematics. In mathematical competitions, problems of elementary number theory occur frequently. These problems use little knowledge and have many variations. They are flexible and diverse. In this book, the author introduces some basic concepts and methods in elementary number theory via problems in mathematical competitions. Readers are encouraged to try to solve the problems by themselves before they read the given solutions of examples. Only in this way can they truly appreciate the tricks of problem-solving.

Shifting Meanings, Values and Approaches

Euclidean Geometry in Mathematical Olympiads

Navigating Model Minority Stereotypes

Low Attainers in Primary Mathematics

A Second Step to Mathematical Olympiad Problems

In Mathematical Olympiad and Competitions

