

Recent Advances In Geometric Inequalities Mathematics And Its Applications

????6?,?????????,?????????????,????????,????????????????????,????????????????????????????

A compilation of 380 of SIAM Review's most interesting problems dating back to the journal's inception in 1959.

This volume presents advances that have been made over recent decades in areas of research featuring Hardy's inequality and related topics. The inequality and its extensions and refinements are not only of intrinsic interest but are indispensable tools in many areas of mathematics and mathematical physics. Hardy inequalities on domains have a substantial role and this necessitates a detailed investigation of significant geometric properties of a domain and its boundary. Other topics covered in this volume are Hardy- Sobolev-Maz'ya inequalities; inequalities of Hardy-type involving magnetic fields; Hardy, Sobolev and Cwikel-Lieb-Rosenbljum inequalities for Pauli operators; the Rellich inequality. The Analysis and Geometry of Hardy's Inequality provides an up-to-date account of research in areas of contemporary interest and would be suitable for a graduate course in mathematics or physics. A good basic knowledge of real and complex analysis is a prerequisite.

"The book describes how functional inequalities are often manifestations of natural mathematical structures and physical phenomena, and how a few general principles validate large classes of analytic/geometric inequalities, old and new. This point of view leads to "systematic" approaches for proving the most basic inequalities, but also for improving them, and for devising new ones--sometimes at will and often on demand. These general principles also offer novel ways for estimating best constants and for deciding whether these are attained in appropriate function spaces. As such, improvements of Hardy and Hardy-Rellich type inequalities involving radially symmetric weights are variational manifestations of Sturm's theory on the oscillatory behavior of certain ordinary differential equations. On the other hand, most geometric inequalities, including those of Sobolev and Log-Sobolev type, are simply expressions of the convexity of certain free energy functionals along the geodesics on the Wasserstein manifold of probability measures equipped with the optimal mass transport metric. Caffarelli-Kohn-Nirenberg and Hardy-Rellich-Sobolev type inequalities are then obtained by interpolating the above two classes of inequalities via the classical ones of Hölder. The subtle Moser-Onofri-Aubin inequalities on the two-dimensional sphere are connected to Liouville type theorems for planar mean field equations."--Publisher's website.

Upon publication, the first edition of the CRC Concise Encyclopedia of Mathematics received overwhelming accolades for its unparalleled scope, readability, and utility. It soon took its place among the top selling books in the history of Chapman & Hall/CRC, and its popularity continues unabated. Yet also unabated has been the d

A full exposition of the classical theory of spherical harmonics and their use in proving stability results.

This research-level book presents up-to-date information concerning recent developments in convex functions and partial orderings and some applications in mathematics, statistics, and reliability theory. The book will serve researchers in mathematical and statistical theory and theoretical and applied probabilists. Presents classical and newly published results on convex functions and related inequalities Explains partial ordering based on arrangement and their applications in mathematics, probability, statistics, and reliability Demonstrates the connection of partial ordering with other well-known orderings such as majorization and Schur functions Will generate further research and applications

"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 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.

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.

A 1988 classic, covering Two-dimensional Surfaces; Domains on the Plane and on Surfaces; Brunn-Minkowski Inequality and Classical Isoperimetric Inequality; Isoperimetric Inequalities for Various Definitions of Area; and Inequalities Involving Mean Curvature.

A working knowledge of inequalities can be beneficial to the practicing engineer, and inequalities are central to the definitions of all limiting processes, including differentiation and integration. When exact solutions are unavailable, inconvenient, or unnecessary, inequalities can be used to obtain error bounds for numerical approximation. They can also lead to an understanding of the qualitative behavior of solutions. This guide to inequalities was written specifically with engineers and other applied scientists in mind, and helps fill the gap between college algebra-level treatments, and the formidable treatise on the subject that exist in the mathematics literature. To consolidate the learning process, every chapter ends with a rich collection of exercises.

One service mathematics has rendered the human race. It has

put common sense back Jules Verne where it belongs, on the topmost shelf next to the dusty canister labelled 'discarded non- The series is divergent; therefore we may be sense'. Eric T. Bell able to do something with it. O. Heaviside Mathematics is a tool for thought. A highly necessary tool in a world where both feedback and non linearities abound. Similarly, all kinds of parts of mathematics serve as tools for other parts and for other sciences. Applying a simple rewriting rule to the quote on the right above one finds such statements as: 'One service topology has rendered mathematical physics .. .'; 'One service logic has rendered computer science .. .'; 'One service category theory has rendered mathematics .. .'. All arguably true. And all statements obtainable this way form part of the *raison d'être* of this series.

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 mathematics competitions, and for anyone who loves math.

This book constitutes the thoroughly refereed post-workshop proceedings of the 8th International Workshop on Automated Deduction in Geometry, ADG 2010, held in Munich, Germany in July 2010. The 13 revised full papers presented were carefully selected during two rounds of reviewing and improvement from the lectures given at the workshop. Topics addressed by the papers are incidence geometry using some kind of combinatoric argument; computer algebra; software implementation; as well as logic and proof assistants.

The International Conference on Computational Science (ICCS 2004) held in Kraków, Poland, June 6–9, 2004, was a follow-up to the highly successful ICCS 2003 held at two locations, in Melbourne, Australia and St. Petersburg, Russia; ICCS 2002 in Amsterdam, The Netherlands; and ICCS 2001 in San Francisco, USA. As computational science is still evolving in its quest for subjects of investigation and efficient methods, ICCS 2004 was devised as a forum for scientists from mathematics and computer science, as the basic computing disciplines and application areas, interested in advanced computational methods for physics, chemistry, life sciences, engineering, arts and humanities, as well as computer system vendors and software developers. The main objective of this conference was to discuss problems and solutions in all areas, to identify new issues, to shape future directions of research, and to help users apply various advanced computational techniques. The event harvested recent developments in computational grids and next generation computing systems, tools, advanced numerical methods, data-driven systems, and novel applications, such as complex systems, finance, econo-physics and population evolution.

Introduces the richness and variety of inequalities in mathematics using illustration and visualisation.

This textbook presents various automatic techniques based on Gröbner bases elimination to prove well-known geometrical theorems and formulas. Besides proving theorems, these methods are used to discover new formulas, solve geometric inequalities, and construct objects — which cannot be easily done with a ruler and compass. Each problem is firstly solved by an automatic theorem proving method. Secondly, problems are solved classically — without using computer where possible — so that readers can compare the strengths and weaknesses of both approaches.

The Second International Workshop on Automated Deduction in Geometry (ADG '98) was held in Beijing, China, August 1–3, 1998. An increase of interest in ADG '98 over the previous workshop ADG '96 is represented by the notable number of more than 40 participants from ten countries and the strong technical program of 25 presentations, of which two one-hour invited talks were given by Professors Wen-tsun Wu and Jing-Zhong Zhang. The workshop provided the participants with a well-focused forum for effective exchange of new ideas and timely report of research progress. Insight surveys, algorithmic developments, and applications in CAGD/CAD and computer vision presented by active researchers, together with geometry software demos, shed light on the features of this second workshop. ADG '98 was hosted by the Mathematics Mechanization Research Center (MMRC) with financial support from the Chinese Academy of Sciences and the French National Center for Scientific Research (CNRS), and was organized by the three co-editors of this proceedings volume. The papers contained in the volume were selected, under a strict refereeing procedure, from those presented at ADG '98 and submitted afterwards. Most of the 14 accepted papers were carefully revised and some of the revised versions were checked again by external reviewers. We hope that these papers cover some of the most recent and significant research results and developments and reflect the current state-of-the-art of ADG.

This book contains an up-to-date survey and self-contained chapters on contact slant submanifolds and geometry, authored by internationally renowned researchers. The notion of slant submanifolds was introduced by Prof. B.Y. Chen in 1990, and A. Lotta extended this notion in the framework of contact geometry in 1996. Numerous differential geometers have since obtained interesting results on contact slant submanifolds. The book gathers a wide range of topics such as warped product semi-slant submanifolds, slant submersions, semi-slant f -, hemi-slant f -Riemannian submersions, quasi hemi-slant submanifolds, slant submanifolds of metric f -manifolds, slant lightlike submanifolds, geometric inequalities for slant submanifolds, 3-slant submanifolds, and semi-slant submanifolds of almost paracontact manifolds. The book also includes interesting results on slant curves and magnetic curves, where the latter represents trajectories moving on a Riemannian manifold under the action of magnetic field. It presents detailed information on the most recent advances in the area, making it of much value to scientists, educators and graduate students.

This volume contains the proceedings of the AMS Special Session on Geometry of Submanifolds, held from October 25–26, 2014, at San Francisco State University, San Francisco, CA, and the AMS Special Session on Recent Advances in the Geometry of

Submanifolds: Dedicated to the Memory of Franki Dillen (1963–2013), held from March 14–15, 2015, at Michigan State University, East Lansing, MI. The focus of the volume is on recent studies of submanifolds of Riemannian, semi-Riemannian, Kaehlerian and contact manifolds. Some of these use techniques in classical differential geometry, while others use methods from ordinary differential equations, geometric analysis, or geometric PDEs. By brainstorming on the fundamental problems and exploring a large variety of questions studied in submanifold geometry, the editors hope to provide mathematicians with a working tool, not just a collection of individual contributions. This volume is dedicated to the memory of Franki Dillen, whose work in submanifold theory attracted the attention of and inspired many geometers.

Analytic and Geometric Inequalities and Applications is devoted to recent advances in a variety of inequalities of Mathematical Analysis and Geometry. Subjects dealt with in this volume include: Fractional order inequalities of Hardy type, differential and integral inequalities with initial time difference, multi-dimensional integral inequalities, Opial type inequalities, Gruss' inequality, Furuta inequality, Laguerre-Samuelson inequality with extensions and applications in statistics and matrix theory, distortion inequalities for analytic and univalent functions associated with certain fractional calculus and other linear operators, problem of infimum in the positive cone, alpha-quasi convex functions defined by convolution with incomplete beta functions, Chebyshev polynomials with integer coefficients, extremal problems for polynomials, Bernstein's inequality and Gauss-Lucas theorem, numerical radii of some companion matrices and bounds for the zeros of polynomials, degree of convergence for a class of linear operators, open problems on eigenvalues of the Laplacian, fourth order obstacle boundary value problems, bounds on entropy measures for mixed populations as well as controlling the velocity of Brownian motion by its terminal value. A wealth of applications of the above is also included. We wish to express our appreciation to the distinguished mathematicians who contributed to this volume. Finally, it is our pleasure to acknowledge the fine cooperation and assistance provided by the staff of Kluwer Academic Publishers. June 1999 Themistocles M. Rassias Hari M.

This volume is dedicated to the late Professor Dragoslav S. Mitrinovic(1908-1995), one of the most accomplished masters in the domain of inequalities. Inequalities are to be found everywhere and play an important and significant role in almost all subjects of mathematics as well as in other areas of sciences. Professor Mitrinovic used to say: 'There are no equalities, even in human life inequalities are always encountered.' This volume provides an extensive survey of the most current topics in almost all subjects in the field of inequalities, written by 85 outstanding scientists from twenty countries. Some of the papers were presented at the International Memorial Conference dedicated to Professor D.S. Mitrinovic, which was held at the University of Nis, June 20-22, 1996. Audience: This book will be of great interest to researchers in real, complex and functional analysis, special functions, approximation theory, numerical analysis and computation, and other fields, as well as to graduate students requiring the most up-to-date results.

Recent Advances in Geometric Inequalities Springer Science & Business Media
Analytic and Geometric Inequalities and Applications Springer

This book contains tutorial surveys and original research contributions in geometric computing, modeling, and reasoning. Highlighting the role of algebraic computation, it covers: surface blending, implicitization, and parametrization; automated deduction with Clifford algebra and in real geometry; and exact geometric computation. Basic techniques, advanced methods, and new findings are presented coherently, with many examples and illustrations. Using this book the reader will easily cross the frontiers of symbolic computation, computer aided geometric design, and automated reasoning. The book is also a valuable reference for people working in other relevant areas, such as scientific computing, computer graphics, and artificial intelligence. Contents: Algebraic Methods in Computer Aided Geometric Design: Theoretical and Practical Applications (L González-Vega et al.) Constructing Piecewise Algebraic Blending Surfaces (Y Feng et al.) Rational Curves and Surfaces: Algorithms and Some Applications (J R Sendra) Panorama of Methods for Exact Implicitization of Algebraic Curves and Surfaces (I S Kotsireas) Implicitization and Offsetting via Regular Systems (D Wang) Determining the Intersection Curve of Two 3D Implicit Surfaces by Using Differential Geometry and Algebraic Techniques (L González-Vega et al.) Analytical Properties of Semi-Stationary Subdivision Schemes (H Zhang & G Wang) Meshless Method for Numerical Solution of PDE Using Hermitian Interpolation with Radial Basis (Z Wu & J Liu) Clifford Algebras in Geometric Computation (H Li) Automated Deduction in Real Geometry (L Yang & B Xia) Automated Derivation of Unknown Relations and Determination of Geometric Loci (Y Li) On Guaranteed Accuracy Computation (C K Yap) Dixon A-Resultant Quotients for 6-Point Isosceles Triangular Corner Cutting (M-C Foo & E-W Chionh) Face Recognition Using Hidden Markov Models and Artificial Neural Network Techniques (Z Ou & B Xue) Readership: Upper-level undergraduates, graduate students, researchers and engineers in geometric modeling.

Keywords: Algebraic Geometry; Symbolic Computation; Geometric Reasoning; Geometric Modeling; Computer Graphics

This is the third supplementary volume to Kluwer's highly acclaimed twelve-volume Encyclopaedia of Mathematics. This additional volume contains nearly 500 new entries written by experts and covers developments and topics not included in the previous volumes. These entries are arranged alphabetically throughout and a detailed index is included. This supplementary volume enhances the existing twelve volumes, and together, these thirteen volumes represent the most authoritative, comprehensive and up-to-date Encyclopaedia of Mathematics available.

This book constitutes the thoroughly refereed post-workshop proceedings of the 7th International Workshop on Automated Deduction in Geometry, ADG 2008, held in Shanghai, China in September 2008. The 11 revised full papers presented were carefully reviewed and selected from numerous initial submissions for the workshop during two rounds of reviewing and improvement. The papers show the lively variety of topics and methods and the current applicability of automated deduction in geometry to different branches of mathematics such as discrete mathematics, combinatorics, and numerics; symbolic and numeric methods for geometric computation, and geometric constraint solving. Further issues are the design and implementation of geometry software, special-purpose tools, automated theorem provers - in

short applications of ADG to mechanics, geometric modeling, CAGD/CAD, computer vision, robotics and education. This book constitutes the thoroughly refereed post-proceedings of the Third International Workshop on Automated Deduction in Geometry, ADG 2000, held in Zurich, Switzerland, in September 2000. The 16 revised full papers and two invited papers presented were carefully selected for publication during two rounds of reviewing and revision from a total of initially 31 submissions. Among the issues addressed are spatial constraint solving, automated proving of geometric inequalities, algebraic proof, semi-algebraic proofs, geometrical reasoning, computational synthetic geometry, incidence geometry, and nonstandard geometric proofs.

This is Volume II of the four-volume set LNCS 3991-3994 constituting the refereed proceedings of the 6th International Conference on Computational Science, ICCS 2006. The 98 revised full papers and 29 revised poster papers of the main track presented together with 500 accepted workshop papers were carefully reviewed and selected for inclusion in the four volumes. The coverage spans the whole range of computational science.

This volume presents a comprehensive compendium of classical and new inequalities as well as some recent extensions to well-known ones. Variations of inequalities ascribed to Abel, Jensen, Cauchy, Chebyshev, Hölder, Minkowski, Stefferson, Gram, Fejér, Jackson, Hardy, Littlewood, Po'lya, Schwarz, Hadamard and a host of others can be found in this volume. The more than 1200 cited references include many from the last ten years which appear in a book for the first time. The 30 chapters are all devoted to inequalities associated with a given classical inequality, or give methods for the derivation of new inequalities. Anyone interested in equalities, from student to professional, will find their favorite inequality and much more.

[Copyright: e8dd56e7d8b938f806e5ba8dd118b5d0](https://doi.org/10.1007/978-3-540-3991-3)