

2014 School Competition Booklet Mathcounts

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, 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.

Your book is "fabulous". I spent two hours last night working problems from it. I'm planning to use some in what I do with teachers, with citation of course. I love it. I love the clever problems you came up with and the clever solutions of the MATHCOUNTS problems you used. Dr. Harold Reiter, former Chairman of Mathcounts Question Written Committee, Math Professor, UNC at Charlotte Being responsible for the publications we put out at MATHCOUNTS, I understand the incredible amount of work this required. Congratulations on such a great accomplishment. ---Kristen Chandler Mathcounts, Deputy Director & Program Director I just finished going through with it. As for the book, I'm pretty impressed. It really seems you put a lot of time and effort into it, and I liked it. - Calvin Deng 2010 USA IMO Team Member, Silver Medalist I bought this book together with "Twenty More Problem Solving Skills" for my 6th grade daughter, who loves math, and is preparing for AMC and MathCounts competition. She is very excited with these two books, and learns a lot from these two books in her math competition preparation. We recommend this book as a must have math competition collection. - -A parent

The book contains ten tests that can be used to train students' speed and accuracy during Mathcounts competitions at school, chapter, state, and national levels. Each test has two parts. Part I trains students calculation speed with number sense. Part II trains students reading and problem solving skills. Each problem in Part II has the detained solutions.

This is a solution book for 2011 - 2016 Mathcounts National Competition Sprint and Target round problems. The problems are shared free among coaches, parents, and students. You can also contact Mathcounts.org for problems. Don't live in fear of math any longer. Math Magic makes math what you may never have imagined it to be: easy and fun! Scott Flansburg -- "the Human Calculator" who believes that there are no "mathematical illiterates," just people who have not learned how to make math work for them -- demonstrates how everyone can put their phobia to rest and deal with essential every-day mathematical calculations with confidence. This is the book for millions of otherwise successful adults who are afraid to balance their checkbooks and don't know how to figure interest on savings or credit, and for the millions of students who dread their math classes and live in fear of the SAT math section. In Math Magic, Scott Flansburg shows the reader how to: Master the basics, including the real way addition, subtraction, multiplication, and division work Simplify calculations through estimation Quick-check answers Convert metric measures to more familiar ones Figure tips, taxes, and percentages -- never get short-changed again! Master algebra using the nine easy steps to algebra Math Magic is for all of us who need and want to improve our understanding of math. With the help of Flansburg, the Guinness World Record holder as the Fastest Human Calculator, you can do math just like magic.

Beast Academy Guide 2D and its companion Practice 2D (sold separately) are the fourth part in a four-part series for 2nd grade mathematics. Book 2d includes chapters on big numbers, algorithms for additional and subtractions, and problem solving.

"...offer[s] a challenging exploration of problem solving mathematics and preparation for programs such as MATHCOUNTS and the American Mathematics Competition."--Back cover

Understanding and overcoming the gender gap in computer science education. The information technology revolution is transforming almost every aspect of society, but girls and women are largely out of the loop. Although women surf the Web in equal numbers to men and make a majority of online purchases, few are involved in the design and creation of new technology. It is mostly men whose perspectives and priorities inform the development of computing innovations and who reap the lion's share of the financial rewards. As only a small fraction of high school and college computer science students are female, the field is likely to remain a "male clubhouse," absent major changes. In Unlocking the Clubhouse, social scientist Jane Margolis and computer scientist and educator Allan Fisher examine the many influences contributing to the gender gap in computing. The book is based on interviews with more than 100 computer science students of both sexes from Carnegie Mellon University, a major center of computer science research, over a period of four years, as well as classroom observations and conversations with hundreds of college and high school faculty. The interviews capture the dynamic details of the female computing experience, from the family computer kept in a brother's bedroom to women's feelings of alienation in college computing classes. The authors investigate the familial, educational, and institutional origins of the computing gender gap. They also describe educational reforms that have made a dramatic difference at Carnegie Mellon—where the percentage of women entering the School of Computer Science rose from 7% in 1995 to 42% in 2000—and at high schools around the country.

"Beyond the Tiger Mom is a brilliant book—hard-hitting and brutally honest but also balanced, insightful, and funny." —Amy Chua, author of Battle Hymn of the Tiger Mom Dispel the hype and myths about Asian parenting and uncover the practical with this effective parenting guide. Help your child achieve maximum academic potential Train your child to expand his or her attention span Find the right balance between work and play Help your child see failure as a learning experience Learn how to raise tech-healthy kids How do Asian parents prime their children for success from a young age? Why do Asian kids do so well in math and science? What is the difference between an Asian upbringing and a Western one? Why do some Asian mothers see themselves as "tiger moms" while others shun the label? How do Asian parents deal with their children's failures? Is it sometimes good for children to fail? These are just a few of the compelling questions posed and answered in this fascinating new parenting book by educator Maya Thiagarajan as she examines the stereotypes and goes beneath the surface to explore what really happens in Asian households. How do Asian parents think about childhood, family and education—and what can Western parents learn from them? Through interviews with hundreds of Asian parents and kids, Thiagarajan offers a detailed look at their values, hopes, fears

and parenting styles. Woven into this narrative are her own reflections on teaching and parenting in Asia and the West. Thiagarajan synthesizes an extensive body of research to provide accessible and practical guidelines for parents. Each chapter ends with a "How To" section of specific tips for Asian and Western parents to aid their child's educational development both inside and outside the classroom.

Enrichment Activities for Gifted Students outlines a variety of extracurricular academic activities and programming options for gifted student talent development. This book: Includes strategies for educators to develop enrichment programs that fit the needs of their students. Provides numerous examples of nationally-recognized and easy-to-implement programs and competitions. Helps promote students' academic growth. Categorizes options by subject area, including math, science, technology, language arts, and social studies. Categorizes options by skill type, including creative thinking, problem solving, and adaptability. Enrichment Activities for Gifted Students provides everything busy educators need to know about offering, funding, and supporting enrichment activities and programs that develop students' content knowledge and expertise, build valuable real-world skills, and extend learning beyond the walls of the classroom.

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 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 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.

An up-close look at the education arms race of after-school learning, academic competitions, and the perceived failure of even our best schools to educate children Beyond soccer leagues, music camps, and drama lessons, today's youth are in an education arms race that begins in elementary school. In Hyper Education, Pawan Dhingra uncovers the growing world of high-achievement education and the after-school learning centers, spelling bees, and math competitions that it has spawned. It is a world where immigrant families vie with other Americans to be at the head of the class, putting in hours of studying and testing in order to gain a foothold in the supposed meritocracy of American public education. A world where enrichment centers, like Kumon, have seen 194 percent growth since 2002 and target children as young as three. Even families and teachers who avoid after-school academics are getting swept up. Drawing on over 100 in-depth interviews with teachers, tutors, principals, children, and parents, Dhingra delves into the why people participate in this phenomenon and examines how schools, families, and communities play their part. Moving past "Tiger Mom" stereotypes, he addresses why Asian American and white families practice what he calls "hyper education" and whether or not it makes sense. By taking a behind-the-scenes look at the Scripps National Spelling Bee, other national competitions, and learning centers, Dhingra shows why good schools, good grades, and good behavior are seen as not enough for high-achieving students and their parents and why the education arms race is likely to continue to expand.

"AMTE, in the Standards for Preparing Teachers of Mathematics, puts forward a national vision of initial preparation for all Pre-K-12 teachers who teach mathematics. SPTM pertains not only to middle and high school mathematics teachers who may teach mathematics exclusively but also to elementary school teachers teaching all disciplines, special education teachers, teachers of emergent multilingual students, and all other teaching professionals and administrators who have responsibility for students' mathematical learning. SPTM has broad implications for teacher preparation programs, in which stakeholders include faculty and administrators in both education and mathematics at the university level; teachers, principals, and district leaders in the schools with which preparation programs partner; and the communities in which preparation programs and their school partners are situated. SPTM is intended as a national guide that articulates a vision for mathematics teacher preparation and supports the continuous improvement of teacher preparation programs. Such continuous improvement includes changes to preparation program courses and structures, partnerships involving schools and universities and their leaders, the ongoing accreditation of such programs regionally and nationally, and the shaping of state and national mathematics teacher preparation policy. SPTM is also designed to inform accreditation processes for mathematics teacher preparation programs, to influence policies related to preparation of teachers of mathematics, and to promote national dialogue around preparing teachers of mathematics. The vision articulated in SPTM is aspirational in that it describes a set of high expectations for developing a well-prepared beginning mathematics teacher who can support meaningful student learning. The vision is research-based and establishes a set of goals for the continued development and refinement of a mathematics teacher preparation program and a research agenda for the study of the effects of such a program. SPTM contains detailed depictions of what a well-prepared beginning teacher knows and is able to do related to content, pedagogy, and disposition, and what a strong preparation program entails with respect to learning experiences, assessments, and partnerships. Stakeholders in mathematics teacher preparation will find messages related to their roles. Standards for Preparing Teachers of Mathematics includes standards and indicators for teacher candidates and for the design of teacher preparation programs. SPTM outlines assessment practices related to overall quality, program effectiveness, and candidate performance. SPTM describes specific focal practices by grade band and provides guidance to stakeholders regarding processes for productive change"--

Jane Chen is the author of the book "The Most Challenging MATHCOUNTS(R) Problems Solved" published by MATHCOUNTS Foundation. The revised edition (Jan. 5, 2014) of the book contains 20 Mathcounts Target Round Tests with the detailed solutions. The problems are very similar to real Mathcounts State/National competitions.

Critically acclaimed and commercially successful, this resource is packed with useful information and instruction. Features proven teaching techniques, games, and more. Suitable for parents of children from preschool to age 10. 2006 edition.

Follows six American high school students on the quest for glory in the Olympics of math competitions--The International Mathematical Olympiad.

This book starts with number sense and mental techniques that every math contestant should know and proceeds to cover the fundamental

skills within the middle school curriculum. This book is written by a true professional who knows what it takes to win math competitions. Mental skills and visualization techniques are emphasized. Throughout the book understanding, reasoning and techniques are emphasized rather than memorizing anything. Five practice tests and their corresponding solutions are included at the end of the book. For the Rising Math Olympians contains over 500 examples and brand-new problems in Number Theory, Algebra, Counting & Probability, and Geometry that are frequently tested in math competitions. Each chapter contains concepts with detailed explanations, examples with step-by-step solutions, and review problems to reinforce the students' understanding. This book is written for beginning mathletes who are interested in learning advanced problem solving and critical thinking skills in preparation for elementary and middle school math competitions. For the past three years, Jesse has served as an assistant coach for his former middle school math team and the curriculum director for the Maui Math Circle. In 2016, three of his students finished in the top 10 in the Hawaii State Mathcounts Competition. This book consists of the top 20 math concepts that he used to train his students.

Math Really Counts (Volume I) provides a fresh perspective on common math competition concepts by emphasizing their real-life applications. From RSA encryption to burger orders, from aerospace research to construction planning, it's undeniable that mathematics is the backbone of life as we know it. This book helps readers at once develop their problem-solving intuition and realize the endless applicability of math. Each chapter is structured to best facilitate student understanding: concise, easy-to-ingest lecture followed by thorough step-by-step examples and abounding with challenging problems for students to try. Every set of problems is complete with comprehensive solutions. This book is written for beginning to intermediate mathletes with some exposure to competition math, who want to learn important concepts and problem solving strategies in a real-world context. Students will learn from the eyes of cyclists, florists, carpenters, conductors, and customers as they delve into important concepts in Number Theory, Algebra, and Combinatorics. The first volume contains over 150 original examples and problems, organized in the following chapters: Prime Numbers and Prime Factorization GCD and LCM Optimization Distance, Speed, and Time Counting and Probability Answers Solutions To learn more and connect with a budding community of curious mathletes, please join us at: <http://MathReallyCounts.org>.

This book can be used by 5th to 8th grade students preparing for AMC 8. Each chapter consists of (1) basic skill and knowledge section with plenty of examples, (2) about 30 exercise problems, and (3) detailed solutions to all problems.

Mathcounts National Competition SolutionsCreatespace Independent Publishing Platform

This book can be used by 6th to 8th grade students preparing for Mathcounts Chapter and State Competitions. This book contains a collection of five sets of practice tests for MATHCOUNTS Chapter (Regional) competitions, including Sprint, and Target rounds. One or more detailed solutions are included for every problem. Please email us at mymathcounts@gmail.com if you see any typos or mistakes or you have a different solution to any of the problems in the book. We really appreciate your help in improving the book. We would also like to thank the following people who kindly reviewed the manuscripts and made valuable suggestions and corrections: Kevin Yang (IA), Skyler Wu (CA), Reece Yang (IA), Kelly Li (IL), Geoffrey Ding (IL), Raymond Suo (KY), Sreeni Bajji (MI), Yashwanth Bajji (MI), Ying Peng, Ph.D. (MN), Eric Lu (NC), Akshra Paimagam (NC), Sean Jung (NC), Melody Wen (NC), Esha Agarwal (NC), Jason Gu (NJ), Daniel Ma (NY), Yiqing Shen (TN), Tristan Ma (VA), Chris Kan (VA), and Evan Ling (VA).

Elementary School Math Contests contains over 500 challenging math contest problems and detailed step-by-step solutions in Number Theory, Algebra, Counting & Probability, and Geometry. The problems and solutions are accompanied with formulas, strategies, and tips. This book is written for beginning mathletes who are interested in learning advanced problem solving and critical thinking skills in preparation for elementary and middle school math competitions.

Written for the gifted math student, the new math coach, the teacher in search of problems and materials to challenge exceptional students, or anyone else interested in advanced mathematical problems. Competition Math contains over 700 examples and problems in the areas of Algebra, Counting, Probability, Number Theory, and Geometry. Examples and full solutions present clear concepts and provide helpful tips and tricks. "I wish I had a book like this when I started my competition career." Four-Time National Champion MATHCOUNTS coach Jeff Boyd "This book is full of juicy questions and ideas that will enable the reader to excel in MATHCOUNTS and AMC competitions. I recommend it to any students who aspire to be great problem solvers." Former AHSME Committee Chairman Harold Reiter

An investigation into why so few African American and Latino high school students are studying computer science reveals the dynamics of inequality in American schools. The number of African Americans and Latino/as receiving undergraduate and advanced degrees in computer science is disproportionately low, according to recent surveys. And relatively few African American and Latino/a high school students receive the kind of institutional encouragement, educational opportunities, and preparation needed for them to choose computer science as a field of study and profession. In *Stuck in the Shallow End*, Jane Margolis looks at the daily experiences of students and teachers in three Los Angeles public high schools: an overcrowded urban high school, a math and science magnet school, and a well-funded school in an affluent neighborhood. She finds an insidious "virtual segregation" that maintains inequality. Two of the three schools studied offer only low-level, how-to (keyboarding, cutting and pasting) introductory computing classes. The third and wealthiest school offers advanced courses, but very few students of color enroll in them. The race gap in computer science, Margolis finds, is one example of the way students of color are denied a wide range of occupational and educational futures. Margolis traces the interplay of school structures (such factors as course offerings and student-to-counselor ratios) and belief systems—including teachers' assumptions about their students and students' assumptions about themselves. *Stuck in the Shallow End* is a story of how inequality is reproduced in America—and how students and teachers, given the necessary tools, can change the system.

First published in 1985, the Handbook for Achieving Gender Equity Through Education quickly established itself as the essential reference work concerning gender equity in education. This new, expanded edition provides a 20-year retrospective of the field, one that has the great advantage of documenting U.S. national data on the gains and losses in the efforts to advance gender equality through policies such as Title IX, the landmark federal law prohibiting sex discrimination in education, equity programs and research. Key features include: Expertise – Like its predecessor, over 200 expert authors and reviewers provide accurate, consensus, research-based information on the nature of gender equity challenges and what is needed to meet them at all levels of education. Content Area Focus – The analysis of gender equity within specific curriculum areas has been expanded from 6 to 10 chapters including mathematics, science, and engineering. Global/Diversity Focus – Global gender equity is addressed in a separate chapter as well as in numerous other chapters. The expanded section on gender equity strategies for diverse populations contains seven chapters on African Americans, Latina/os, Asian and Pacific Island Americans, American Indians, gifted students, students with disabilities, and lesbian, gay, bisexual, and transgender students. Action Oriented – All chapters contain practical recommendations for making education activities and outcomes more gender equitable. A final chapter consolidates individual chapter recommendations for educators, policymakers, and researchers to achieve gender equity in and through education. New Material – Expanded from 25 to 31 chapters, this new edition includes: *more emphasis on male gender equity and on sexuality issues; *special within population gender equity challenges (race, ability and disability, etc); *coeducation and single sex education; *increased use of rigorous research strategies such as meta-analysis showing more sex similarities and fewer sex differences and of evaluations of implementation programs; *technology and gender equity is now treated in three chapters; *women's and gender studies; *communication skills relating to English, bilingual, and foreign language learning; and *history and implementation of Title IX and other federal and state policies. Since there is so much misleading information about gender equity and education, this Handbook will be essential for anyone who

wants accurate, research-based information on controversial gender equity issues—journalists, policy makers, teachers, Title IX coordinators, equity trainers, women's and gender study faculty, students, and parents.

STEM Integration in K-12 Education examines current efforts to connect the STEM disciplines in K-12 education. This report identifies and characterizes existing approaches to integrated STEM education, both in formal and after- and out-of-school settings. The report reviews the evidence for the impact of integrated approaches on various student outcomes, and it proposes a set of priority research questions to advance the understanding of integrated STEM education. STEM Integration in K-12 Education proposes a framework to provide a common perspective and vocabulary for researchers, practitioners, and others to identify, discuss, and investigate specific integrated STEM initiatives within the K-12 education system of the United States. STEM Integration in K-12 Education makes recommendations for designers of integrated STEM experiences, assessment developers, and researchers to design and document effective integrated STEM education. This report will help to further their work and improve the chances that some forms of integrated STEM education will make a positive difference in student learning and interest and other valued outcomes.

This book teaches you some important math tips that are very effective in solving many Mathcounts problems. It is for students who are new to Mathcounts competitions but can certainly benefit students who compete at state and national levels.

These lectures are based on the MATHCOUNTS Curriculum: • Algebra• Charts, Graphs & Tables• Computation• Consumer Math• Equations & Inequalities• Equivalent Expressions• Estimation & Approximation• Geometry• Logic• Measurement• Number Theory• Probability• Statistics Mathcounts problems follow the Common Core State Standards (CCSS) for mathematics that have been adopted by 44 states. Each lecture includes (1) Basic skills with examples, and (2) Exercises with answer keys.

Iron Thunder

The IMLEM Plus edition of Hard Math is designed for students participating in both the Intermediate Math League of Eastern Massachusetts and Mathcounts(r). The topics align with modern middle school curricula: fractions, decimals, percents, prime factorization, plane and spatial geometry, probability, statistics, combinatorics, algebra, modular arithmetic, etc. But Hard Math challenges students to develop a deeper understanding: it asks much harder questions than standard texts and teaches the material and problem solving strategies students need to attack them. For example, rather than asking students to write $\frac{2}{5}$ as a decimal, it might ask students to use the fact that $99999 = 9 \times 41 \times 271$ to find the tenth digit in the decimal expansion for $\frac{1}{271}$. (It might ask this, but never actually does.) The organization is designed to serve IMLEM students' needs: the first five chapters cover exactly what students should learn for each of IMLEM's monthly contests. But the text can also serve students preparing for other math contests or as general enrichment. The IMLEM Plus edition of Hard Math can be used interchangeably with the IMLEM edition. The only difference is that the IMLEM Plus edition contains an extra chapter covering topics that do not appear on IMLEM contests, but which the author feels are useful to know if a student wants to do very well on Mathcounts(r). Mathcounts(r) is a registered trademark of the Mathcounts Foundation, which was not involved in the production of, and does not endorse, this book.

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