

# Lecture Notes On Mathematical Olympiad Courses Vol 2 For Senior Section Pdf

[LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES VOL 2 FOR SENIOR SECTION PDF](#) - UNVEILING THE MAGIC OF WORDS: A REPORT ON "LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES VOL 2 FOR SENIOR SECTION PDF"

IN A WORLD DEFINED BY INFORMATION AND INTERCONNECTIVITY, THE ENCHANTING POWER OF WORDS HAS ACQUIRED UNPARALLELED SIGNIFICANCE. THEIR POWER TO KINDLE EMOTIONS, PROVOKE CONTEMPLATION, AND IGNITE TRANSFORMATIVE CHANGE IS REALLY AWE-INSPIRING. ENTER THE REALM OF "LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES VOL 2 FOR SENIOR SECTION PDF," A MESMERIZING LITERARY MASTERPIECE PENNED WITH A DISTINGUISHED AUTHOR, GUIDING READERS ON A PROFOUND JOURNEY TO UNRAVEL THE SECRETS AND POTENTIAL HIDDEN WITHIN EVERY WORD. IN THIS CRITIQUE, WE SHALL DELVE INTO THE BOOK'S CENTRAL THEMES, EXAMINE ITS DISTINCTIVE WRITING STYLE, AND ASSESS ITS PROFOUND IMPACT ON THE SOULS OF ITS READERS. RECOGNIZING THE ARTIFICIAL WAYS TO ACQUIRE THIS EBOOK **LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES VOL 2 FOR SENIOR SECTION PDF** IS ADDITIONALLY USEFUL. YOU HAVE REMAINED IN THE RIGHT PLACE TO BEGIN GETTING THIS INFO. GET THE LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES VOL 2 FOR SENIOR SECTION PDF LINK THAT WE OFFER HERE AND CHECK OUT THE LINK.

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**AUTOMATED DEDUCTION – CADE 28** ANDR[?] PLATZER 2021-07-08 THIS OPEN ACCESS BOOK CONSTITUTES THE PROCEEDING OF THE 28TH INTERNATIONAL CONFERENCE ON AUTOMATED DEDUCTION, CADE 28, HELD VIRTUALLY IN JULY 2021. THE 29 FULL PAPERS AND 7 SYSTEM DESCRIPTIONS PRESENTED TOGETHER WITH 2 INVITED PAPERS WERE CAREFULLY REVIEWED AND SELECTED FROM 76 SUBMISSIONS. CADE IS THE MAJOR FORUM FOR THE PRESENTATION OF RESEARCH IN ALL ASPECTS OF AUTOMATED DEDUCTION, INCLUDING FOUNDATIONS, APPLICATIONS, IMPLEMENTATIONS, AND PRACTICAL EXPERIENCE. THE PAPERS ARE ORGANIZED IN THE FOLLOWING TOPICS: LOGICAL FOUNDATIONS; THEORY AND PRINCIPLES; IMPLEMENTATION AND APPLICATION; ATP AND AI; AND SYSTEM DESCRIPTIONS.  
**THE CAUCHY-SCHWARZ MASTER CLASS** J. MICHAEL STEELE 2004-04-26 THIS LIVELY, PROBLEM-ORIENTED TEXT, FIRST PUBLISHED IN 2004, IS DESIGNED TO COACH READERS TOWARD MASTERY OF THE MOST FUNDAMENTAL MATHEMATICAL INEQUALITIES. WITH THE CAUCHY-SCHWARZ INEQUALITY AS THE INITIAL GUIDE, THE READER IS LED THROUGH A SEQUENCE OF FASCINATING PROBLEMS WHOSE SOLUTIONS ARE PRESENTED AS THEY MIGHT HAVE BEEN DISCOVERED – EITHER BY ONE OF HISTORY’S FAMOUS MATHEMATICIANS OR BY THE READER. THE PROBLEMS EMPHASIZE BEAUTY AND SURPRISE, BUT ALONG THE WAY READERS WILL FIND SYSTEMATIC COVERAGE OF THE GEOMETRY OF SQUARES, CONVEXITY, THE LADDER OF POWER MEANS, MAJORIZATION, SCHUR CONVEXITY, EXPONENTIAL SUMS, AND THE INEQUALITIES OF H[?] LDER, HILBERT, AND HARDY. THE TEXT IS ACCESSIBLE TO ANYONE WHO KNOWS CALCULUS AND WHO CARES ABOUT SOLVING PROBLEMS. IT IS WELL SUITED TO SELF-STUDY, DIRECTED STUDY, OR AS A SUPPLEMENT TO COURSES IN ANALYSIS, PROBABILITY, AND COMBINATORICS.

**CENTRAL EUROPEAN OLYMPIAD, A: THE MATHEMATICAL DUEL** GERETSCHLAGER ROBERT 2017-11-29 THIS BOOK CONTAINS THE MOST INTERESTING PROBLEMS FROM THE FIRST 24 YEARS OF THE “MATHEMATICAL DUEL,” AN ANNUAL INTERNATIONAL MATHEMATICS COMPETITION BETWEEN THE STUDENTS OF FOUR SCHOOLS: THE GYM[?] ZIUM MIKUL[?] [?] E KOPERN[?] KA IN B[?] LOVEC, CZECH REPUBLIC, THE AKADEMICKI ZESP[?] [?] SZK[?] [?] OG[?] LNOKSZTA[?] C[?] CYCH IN CHORZ[?] W, POLAND, THE BUNDESREALGYMNASIUM KEPLER IN GRAZ, AUSTRIA, AND THE GYM[?] ZIUM JAKUBA [?] KODY IN P[?] EROV, CZECH REPUBLIC. THE PROBLEMS ARE PRESENTED BY TOPIC, GROUPED UNDER THE HEADINGS GEOMETRY, COMBINATORICS, NUMBER THEORY AND ALGEBRA, WHICH IS TYPICAL FOR OLYMPIAD-STYLE COMPETITIONS. ABOVE ALL, IT IS OF INTEREST TO STUDENTS PREPARING FOR MATHEMATICS COMPETITIONS AS WELL AS TEACHERS LOOKING FOR MATERIAL TO PREPARE THEIR STUDENTS, AS WELL AS MATHEMATICALLY INTERESTED ENTHUSIASTS FROM ALL WALKS OF LIFE LOOKING FOR AN INTELLECTUAL CHALLENGE. CONTENTS: INTRODUCTION NUMBER THEORY ALGEBRA COMBINATORICS GEOMETRY 4! YEARS OF PROBLEMS READERSHIP: GENERAL PUBLIC, STUDENTS AND TEACHERS PREPARING FOR OLYMPIAD-STYLE MATHEMATICAL COMPETITIONS KEYWORDS: MATHEMATICS COMPETITION; PROBLEM SOLVING REVIEW: KEY FEATURES: THE WIDE SELECTION OF PROBLEMS MAKES IT ESPECIALLY INTERESTING FOR STUDENTS AND TEACHERS PREPARING FOR OLYMPIAD-STYLE MATHEMATICAL COMPETITIONS THE PARTICIPANTS IN THIS PARTICULAR COMPETITION RANGE IN AGE FROM 13 TO 18, AND THE PROBLEMS ARE CREATED WITH THIS WIDE RANGE IN MIND ANY INTERESTED READER IS BOUND TO FIND SOMETHING INTERESTING TO SUIT THEIR OWN LEVEL OF EXPERIENCE  
**MATH OLYMPIAD CONTEST PROBLEMS FOR ELEMENTARY AND MIDDLE SCHOOLS** GEORGE LENCHNER 1997  
**GRAPH THEORY** BIN XIONG 2010-03-17 IN 1736, THE MATHEMATICIAN EULER INVENTED GRAPH THEORY WHILE SOLVING THE KONIGSBERG 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.  
**THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION 1985-2000** KIRAN S. KEDLAYA 2002 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, 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.

**EUCLIDEAN GEOMETRY IN MATHEMATICAL OLYMPIADS** EVAN CHEN 2021-08-23 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.

**GEOMETRIC INEQUALITIES** GANGSONG LENG 2015-10-21 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.

**A FIRST STEP TO MATHEMATICAL OLYMPIAD PROBLEMS** DEREK HOLTON 2009-07-30 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 COMPREHENSIBLE TO ADOLESCENTS. THIS BOOK IS ALSO A MUST-READ FOR COACHES AND INSTRUCTORS OF MATHEMATICAL COMPETITIONS.

**LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES: FOR SENIOR SECTION - VOLUME 1** JIAGU XU 2012-03-21 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 COURSES CONDUCTED BY THE AUTHOR IN SINGAPORE. ITS SCOPE AND DEPTH NOT ONLY COVERS AND BEYOND THE USUAL SYLLABUS, BUT INTRODUCES A VARIETY OF CONCEPTS AND METHODS IN MODERN MATHEMATICS AS WELL. IN EACH LECTURE, THE CONCEPTS, THEORIES AND METHODS ARE TAKEN AS THE CORE. THE EXAMPLES SERVE TO EXPLAIN AND ENRICH THEIR INTENTIONS AND TO INDICATE THEIR APPLICATIONS. BESIDES, APPROPRIATE NUMBER OF TEST QUESTIONS IS AVAILABLE FOR THE READERS’ PRACTICE AND TESTING PURPOSE. THEIR DETAILED SOLUTIONS ARE ALSO CONVENIENTLY PROVIDED. THE EXAMPLES ARE NOT VERY COMPLICATED SO READERS CAN EASILY UNDERSTAND. THERE ARE MANY REAL COMPETITION QUESTIONS INCLUDED WHICH STUDENTS CAN USE TO VERIFY THEIR ABILITIES. THESE TEST QUESTIONS ORIGINATE FROM MANY COUNTRIES ALL OVER THE WORLD. THIS BOOK WILL SERVE AS A USEFUL TEXTBOOK OF MATHEMATICAL OLYMPIAD COURSES, A SELF-STUDY LECTURE NOTES FOR STUDENTS, OR AS A REFERENCE BOOK FOR RELATED TEACHERS AND RESEARCHERS.

**MATHEMATICAL OLYMPIAD IN CHINA (2009-2010)** BIN XIONG 2013 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 2002 TO 2008 APPEAR IN AN EARLIER VOLUME, MATHEMATICAL OLYMPIAD IN CHINA.”

**A SECOND STEP TO MATHEMATICAL OLYMPIAD PROBLEMS** DEREK ALLAN HOLTON 2011 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.

**METHODS AND TECHNIQUES FOR PROVING INEQUALITIES** YONG SU 2015 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.

**PUTNAM AND BEYOND R<sup>2</sup>** ZVAN GELCA 2017-09-19 THIS BOOK TAKES THE READER ON A JOURNEY THROUGH 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 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, 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 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.

**MATHEMATICAL OLYMPIADS 1998-1999** TITU ANDREESCU 2000-11-02 A LARGE RANGE OF PROBLEMS DRAWN FROM MATHEMATICS OLYMPIADS FROM AROUND THE WORLD.

**CHALLENGE AND THRILL OF PRE-COLLEGE MATHEMATICS** V KRISHNAMURTHY 2007 CHALLENGE AND THRILL OF PRE-COLLEGE MATHEMATICS IS AN UNUSUAL ENRICHMENT TEXT FOR MATHEMATICS OF CLASSES 9, 10, 11 AND 12 FOR USE BY STUDENTS AND TEACHERS WHO ARE NOT CONTENT WITH THE AVERAGE LEVEL THAT ROUTINE TEXT DARE NOT TRANSCEND IN VIEW OF THEIR MASS CLIENTELE. IT COVERS GEOMETRY, ALGEBRA AND TRIGONOMETRY PLUS A LITTLE OF COMBINATORICS. NUMBER THEORY AND PROBABILITY. IT IS WRITTEN SPECIFICALLY FOR THE TOP HALF WHOSE AMBITION IS TO EXCEL AND RISE TO THE PEAK WITHOUT FINDING THE JOURNEY A FORCED UPHILL TASK. THE UNDERCURRENT OF THE BOOK IS TO MOTIVATE THE STUDENT TO ENJOY THE PLEASURES OF A MATHEMATICAL PURSUIT AND OF PROBLEM SOLVING. MORE THAN 300 WORKED OUT PROBLEMS (SEVERAL OF THEM FROM NATIONAL AND INTERNATIONAL OLYMPIADS) SHARE WITH THE STUDENT THE STRATEGY, THE EXCITEMENT, MOTIVATION, MODELING, MANIPULATION, ABSTRACTION, NOTATION AND INGENUITY THAT TOGETHER MAKE MATHEMATICS. THIS WOULD BE THE STARTING POINT FOR THE STUDENT, OF A LIFE-LONG FRIENDSHIP WITH A SOUND MATHEMATICAL WAY OF THINKING. THERE ARE TWO REASONS WHY THE BOOK SHOULD BE IN THE HANDS OF EVERY SCHOOL OR COLLEGE STUDENT, (WHETHER HE BELONGS TO A MATHEMATICS STREAM OR NOT) ONE, IF HE LIKES MATHEMATICS AND, TWO, IF HE DOES NOT LIKE MATHEMATICS- THE FORMER, SO THAT THE CRAMPED ROBOT-TYPE TREATMENT IN THE CLASSROOM DOES NOT MAKE HIM INTO THE LATTER; AND THE LATTER SO THAT BY THE TIME HE IS HALFWAY THROUGH THE BOOK, HE WILL INVITE HIMSELF INTO THE FORMER.

**INTRODUCTION TO TROPICAL GEOMETRY** DIANE MACLAGAN 2021-12-13 TROPICAL GEOMETRY IS A COMBINATORIAL SHADOW OF ALGEBRAIC GEOMETRY, OFFERING NEW POLYHEDRAL TOOLS TO COMPUTE INVARIANTS OF ALGEBRAIC VARIETIES. IT IS BASED ON TROPICAL ALGEBRA, WHERE THE SUM OF TWO NUMBERS IS THEIR MINIMUM AND THE PRODUCT IS THEIR SUM. THIS TURNS POLYNOMIALS INTO PIECEWISE-LINEAR FUNCTIONS, AND THEIR ZERO SETS INTO POLYHEDRAL COMPLEXES. THESE TROPICAL VARIETIES RETAIN A SURPRISING AMOUNT OF INFORMATION ABOUT THEIR CLASSICAL COUNTERPARTS. TROPICAL GEOMETRY IS A YOUNG SUBJECT THAT HAS UNDERGONE A RAPID DEVELOPMENT SINCE THE BEGINNING OF THE 21ST CENTURY. WHILE ESTABLISHING ITSELF AS AN AREA IN ITS OWN RIGHT, DEEP CONNECTIONS HAVE BEEN MADE TO MANY BRANCHES OF PURE AND APPLIED MATHEMATICS. THIS BOOK OFFERS A SELF-CONTAINED INTRODUCTION TO TROPICAL GEOMETRY, SUITABLE AS A COURSE TEXT FOR BEGINNING GRADUATE STUDENTS. PROOFS ARE PROVIDED FOR THE MAIN RESULTS, SUCH AS THE FUNDAMENTAL THEOREM AND THE STRUCTURE THEOREM. NUMEROUS EXAMPLES AND EXPLICIT COMPUTATIONS ILLUSTRATE THE MAIN CONCEPTS. EACH OF THE SIX CHAPTERS CONCLUDES WITH PROBLEMS THAT WILL HELP THE READERS TO PRACTICE THEIR TROPICAL SKILLS, AND TO GAIN ACCESS TO THE RESEARCH LITERATURE. THIS WONDERFUL BOOK WILL APPEAL TO STUDENTS AND RESEARCHERS OF ALL STRIPES: IT BEGINS AT AN UNDERGRADUATE LEVEL AND ENDS WITH DEEP CONNECTIONS TO TORIC VARIETIES, COMPACTIFICATIONS, AND DEGENERATIONS. IN BETWEEN, THE AUTHORS PROVIDE THE FIRST COMPLETE PROOFS IN BOOK FORM OF MANY FUNDAMENTAL RESULTS IN THE SUBJECT. THE PAGES ARE SPRINKLED WITH ILLUMINATING EXAMPLES, APPLICATIONS, AND EXERCISES, AND THE WRITING IS LUCID AND METICULOUS THROUGHOUT. IT IS THAT RARE KIND OF BOOK WHICH WILL BE USED EQUALLY AS AN INTRODUCTORY TEXT BY STUDENTS AND AS A REFERENCE FOR EXPERTS. —MATT BAKER, GEORGIA INSTITUTE OF TECHNOLOGY TROPICAL GEOMETRY IS AN EXCITING NEW FIELD, WHICH REQUIRES TOOLS FROM VARIOUS PARTS OF MATHEMATICS AND HAS CONNECTIONS WITH MANY AREAS. A SHORT DEFINITION IS GIVEN BY MACLAGAN AND STURMFELS: "TROPICAL GEOMETRY IS A MARRIAGE BETWEEN ALGEBRAIC AND POLYHEDRAL GEOMETRY". THIS WONDERFUL BOOK IS A PLEASANT AND REWARDING JOURNEY

THROUGH DIFFERENT LANDSCAPES, INVITING THE READERS FROM A DAY AT A BEACH TO THE HILLS OF MODERN ALGEBRAIC GEOMETRY. THE AUTHORS PRESENT BUILDING BLOCKS, EXAMPLES AND EXERCISES AS WELL AS RECENT RESULTS IN TROPICAL GEOMETRY, WITH INGREDIENTS FROM ALGEBRA, COMBINATORICS, SYMBOLIC COMPUTATION, POLYHEDRAL GEOMETRY AND ALGEBRAIC GEOMETRY. THE VOLUME WILL APPEAL BOTH TO BEGINNING GRADUATE STUDENTS WILLING TO ENTER THE FIELD AND TO RESEARCHERS, INCLUDING EXPERTS. —ALICIA DICKENSTEIN, UNIVERSITY OF BUENOS AIRES, ARGENTINA

**INTRODUCTION TO MATHEMATICAL THINKING** KEITH J. DEVLIN 2012 "MATHEMATICAL THINKING IS NOT THE SAME AS 'DOING MATH'-- UNLESS YOU ARE A PROFESSIONAL MATHEMATICIAN. FOR MOST PEOPLE, 'DOING MATH' MEANS THE APPLICATION OF PROCEDURES AND SYMBOLIC MANIPULATIONS. MATHEMATICAL THINKING, IN CONTRAST, IS WHAT THE NAME REFLECTS, A WAY OF THINKING ABOUT THINGS IN THE WORLD THAT HUMANS HAVE DEVELOPED OVER THREE THOUSAND YEARS. IT DOES NOT HAVE TO BE ABOUT MATHEMATICS AT ALL, WHICH MEANS THAT MANY PEOPLE CAN BENEFIT FROM LEARNING THIS POWERFUL WAY OF THINKING, NOT JUST MATHEMATICIANS AND SCIENTISTS."--BACK COVER.

**CHALLENGING MATHEMATICAL PROBLEMS WITH ELEMENTARY SOLUTIONS** . . . ???? 1987-01-01 VOLUME II OF A TWO-PART SERIES, THIS BOOK FEATURES 74 PROBLEMS FROM VARIOUS BRANCHES OF MATHEMATICS. TOPICS INCLUDE POINTS AND LINES, TOPOLOGY, CONVEX POLYGONS, THEORY OF PRIMES, AND OTHER SUBJECTS. COMPLETE SOLUTIONS.

**PROBLEMS OF NUMBER THEORY IN MATHEMATICAL COMPETITIONS** HONG-BING YU 2010 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.

**SEQUENCES AND MATHEMATICAL INDUCTION: IN MATHEMATICAL OLYMPIAD AND COMPETITIONS (2ND EDITION)** ZHI-GANG FENG 2019-10-08 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.

**LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES** JIAGU XU 2010 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 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 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 16: QUADRATIC SURD EXPRESSIONS AND THEIR OPERATIONS (183k). REQUEST INSPECTION COPY. CONTENTS.: VOLUME 2: CONGRUENCE OF INTEGERS; DECIMAL REPRESENTATION OF INTEGERS; PIGEONHOLE PRINCIPLE; LINEAR INEQUALITY AND SYSTEM OF LINEAR INEQUALITIES; INEQUALITIES WITH ABSOLUTE VALUES; GEOMETRIC INEQUALITIES; SOLUTIONS TO TESTING QUESTIONS; AND OTHER CHAPTERS. READERSHIP: MATHEMATICS STUDENTS, SCHOOL TEACHERS, COLLEGE LECTURERS, UNIVERSITY PROFESSORS; MATHEMATICS ENTHUSIASTS.

**COMBINATORIAL PROBLEMS IN MATHEMATICAL COMPETITIONS** YAO ZHANG 2011 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.

**MATHEMATICAL OLYMPIAD IN CHINA (2007-2008)** BIN XIONG 2009 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 2002-2006 APPEAR IN AN EARLIER VOLUME, MATHEMATICAL OLYMPIAD IN CHINA.

**INEQUALITIES** RADMILA BULAJICH MANFRINO 2010-01-01 THIS BOOK IS INTENDED FOR THE MATHEMATICAL OLYMPIAD STUDENTS WHO

WISH TO PREPARE FOR THE STUDY OF INEQUALITIES, A TOPIC NOW OF FREQUENT USE AT VARIOUS LEVELS OF MATHEMATICAL COMPETITIONS. IN THIS VOLUME WE PRESENT BOTH CLASSIC INEQUALITIES AND THE MORE USEFUL INEQUALITIES FOR CONFRONTING AND SOLVING OPTIMIZATION PROBLEMS. AN IMPORTANT PART OF THIS BOOK DEALS WITH GEOMETRIC INEQUALITIES AND THIS FACT MAKES A BIG DIFFERENCE WITH RESPECT TO MOST OF THE BOOKS THAT DEAL WITH THIS TOPIC IN THE MATHEMATICAL OLYMPIAD. THE BOOK HAS BEEN ORGANIZED IN FOUR CHAPTERS WHICH HAVE EACH OF THEM A DIFFERENT CHARACTER. CHAPTER 1 IS DEDICATED TO PRESENT BASIC INEQUALITIES. MOST OF THEM ARE NUMERICAL INEQUALITIES GENERALLY LACKING ANY GEOMETRIC MEANING. HOWEVER, WHERE IT IS POSSIBLE TO PROVIDE A GEOMETRIC INTERPRETATION, WE INCLUDE IT AS WE GO ALONG. WE EMPHASIZE THE IMPORTANCE OF SOME OF THESE INEQUALITIES, SUCH AS THE INEQUALITY BETWEEN THE ARITHMETIC MEAN AND THE GEOMETRIC MEAN, THE CAUCHY-SCHWARZ INEQUALITY, THE REARRANGEMENT INEQUALITY, THE JENSEN INEQUALITY, THE MUIRHEAD THEOREM, AMONG OTHERS. FOR ALL THESE, BESIDES GIVING THE PROOF, WE PRESENT SEVERAL EXAMPLES THAT SHOW HOW TO USE THEM IN MATHEMATICAL OLYMPIAD PROBLEMS. WE ALSO EMPHASIZE HOW THE SUBSTITUTION STRATEGY IS USED TO DEDUCE SEVERAL INEQUALITIES.

LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES: FOR SENIOR SECTION - VOLUME 2 JIAGU XU 2012-03-21 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 COURSES CONDUCTED BY THE AUTHOR IN SINGAPORE. ITS SCOPE AND DEPTH NOT ONLY COVERS AND BEYOND THE USUAL SYLLABUS, BUT INTRODUCES A VARIETY OF CONCEPTS AND METHODS IN MODERN MATHEMATICS AS WELL. IN EACH LECTURE, THE CONCEPTS, THEORIES AND METHODS ARE TAKEN AS THE CORE. THE EXAMPLES SERVE TO EXPLAIN AND ENRICH THEIR INTENTIONS AND TO INDICATE THEIR APPLICATIONS. BESIDES, APPROPRIATE NUMBER OF TEST QUESTIONS IS AVAILABLE FOR THE READERS' PRACTICE AND TESTING PURPOSE. THEIR DETAILED SOLUTIONS ARE ALSO CONVENIENTLY PROVIDED. THE EXAMPLES ARE NOT VERY COMPLICATED SO READERS CAN EASILY UNDERSTAND. THERE ARE MANY REAL COMPETITION QUESTIONS INCLUDED WHICH STUDENTS CAN USE TO VERIFY THEIR ABILITIES. THESE TEST QUESTIONS ORIGINATE FROM MANY COUNTRIES ALL OVER THE WORLD. THIS BOOK WILL SERVE AS A USEFUL TEXTBOOK OF MATHEMATICAL OLYMPIAD COURSES, A SELF-STUDY LECTURE NOTES FOR STUDENTS, OR AS A REFERENCE BOOK FOR RELATED TEACHERS AND RESEARCHERS.

AN INTRODUCTION TO DIOPHANTINE EQUATIONS TITU ANDREESCU 2010-09-02 THIS PROBLEM-SOLVING BOOK IS AN INTRODUCTION TO THE STUDY OF DIOPHANTINE EQUATIONS, A CLASS OF EQUATIONS IN WHICH ONLY INTEGER SOLUTIONS ARE ALLOWED. THE PRESENTATION FEATURES SOME CLASSICAL DIOPHANTINE EQUATIONS, INCLUDING LINEAR, PYTHAGOREAN, AND SOME HIGHER DEGREE EQUATIONS, AS WELL AS EXPONENTIAL DIOPHANTINE EQUATIONS. MANY OF THE SELECTED EXERCISES AND PROBLEMS ARE ORIGINAL OR ARE PRESENTED WITH ORIGINAL SOLUTIONS. AN INTRODUCTION TO DIOPHANTINE EQUATIONS: A PROBLEM-BASED APPROACH IS INTENDED FOR UNDERGRADUATES, ADVANCED HIGH SCHOOL STUDENTS AND TEACHERS, MATHEMATICAL CONTEST PARTICIPANTS — INCLUDING OLYMPIAD AND PUTNAM COMPETITORS — AS WELL AS READERS INTERESTED IN ESSENTIAL MATHEMATICS. THE WORK UNIQUELY PRESENTS UNCONVENTIONAL AND NON-ROUTINE EXAMPLES, IDEAS, AND TECHNIQUES.

LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES JIAGU XU 2010 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 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 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; 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

FUNCTIONAL EQUATIONS IN MATHEMATICAL OLYMPIADS (2017 - 2018) AMIR HOSSEIN PARVARDI 2018-05-29 FUNCTIONAL EQUATIONS, WHICH ARE A BRANCH OF ALGEBRAIC PROBLEMS USED IN MATHEMATICAL COMPETITIONS, APPEAR IN RECENT OLYMPIADS VERY FREQUENTLY. THE CURRENT BOOK IS THE FIRST VOLUME IN A SERIES OF BOOKS ON COLLECTIONS OF SOLVED PROBLEMS IN FUNCTIONAL EQUATIONS. THIS VOLUME CONTAINS 175 PROBLEMS ON THE SUBJECT, INCLUDING THOSE USED IN LATEST MATHEMATICAL OLYMPIADS (2017 - 2018) AROUND THE WORLD. THE BASIC CONCEPTS OF FUNCTIONAL EQUATIONS AND TECHNIQUES OF PROBLEM SOLVING HAVE BEEN BRIEFLY DISCUSSED IN THE PREAMBLE OF THE BOOK.

103 TRIGONOMETRY PROBLEMS TITU ANDREESCU 2006-03-06 \* 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

MATHEMATICAL OLYMPIAD IN CHINA (2011-2014): PROBLEMS AND SOLUTIONS BIN XIONG 2018-03-22 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.

LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES JIAGU XU 2010

THE IMO COMPENDIUM DUJUAN DJUKIĆ 2011-05-05 "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.

LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES JIAGU XU 2010 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 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 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.

PROBABILITY AND EXPECTATION ZUN SHAN 2016-07-14 IN CHINA, LOTS OF EXCELLENT STUDENTS WHO ARE GOOD AT MATHS TAKE 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, 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. THIS BOOK WILL, IN AN INTERESTING PROBLEM-SOLVING WAY, EXPLAIN WHAT PROBABILITY THEORY IS: ITS CONCEPTS, METHODS AND MEANINGS; PARTICULARLY, TWO IMPORTANT CONCEPTS — PROBABILITY AND MATHEMATICAL EXPECTATION (BRIEFLY EXPECTATION) — ARE EMPHASIZED. IT CONSISTS OF 65 PROBLEMS, APPENDED BY 107 EXERCISES AND THEIR ANSWERS.

SOLVING PROBLEMS IN GEOMETRY KIM HOO HANG 2017 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.

SELECTED PROBLEMS OF THE VIETNAMESE MATHEMATICAL OLYMPIAD (1962-2009) HAI CHAU LE 2010 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 FORMATION AND TRAINING OF A NATIONAL TEAM FOR IMO. THE BOOK IS HIGHLY USEFUL FOR 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.

**THE USSR OLYMPIAD PROBLEM BOOK** D. O. SHKLARSKY 2013-04-15 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.

**LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES** JIAGU XU 2009-12-11 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 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 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.

**PROBLEM-SOLVING STRATEGIES** ARTHUR ENGEL 2008-01-19 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 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.