Nonparametric Methods In Change Point Problems Mathematics And Its Applications

Problems with a Point **Problems in Maths for JEE (Main & Advanced) - Volume 1** Iterative Methods for Fixed Point Problems in Hilbert Spaces *Advanced Problems in Mathematics: Preparing for University* Problems With A Point: Exploring Math And Computer Science **Berkeley Problems in Mathematics How to Solve It Change-point Problems Challenging Mathematical Problems with Elementary Solutions, Vol. I Turning Points in the History of Mathematics** 100 Great Problems of Elementary Mathematics *C++ Solutions for Mathematical Problems* Problem-Solving Strategies **Open Middle Math The Math Teacher's Problem-a-Day, Grades 4-8** *The Math Problems Notebook Saddle-Point Problems and Their Iterative Solution* Problems in Mathematical Analysis **Current Problems of Mathematics Mathematics via Problems: Part 2: Geometry Numerical Solution of Two Point Boundary Value Problems Mathematics via Problems One Hundred Problems in Elementary Mathematics Advanced Problems in Mathematics** Nonparametric Methods in Change Point Problems **Problem-Solving Strategies** *Advances in Metric Fixed Point Theory and Applications* **Critical Point Theory A Unified Approach to Interior Point Algorithms for Linear Complementarity Problems** Nonparametric Methods in Change Point Problems **The Ultimate Challenge** 40 Puzzles and Problems in Probability and Mathematical Statistics **5-Minute Math Problem of the Day Mathematical Problem Solving** *Mathematical Analysis and Applications* **Problems in Euclidean Space** *Problems in Maths for JEE (Main & Advanced) - Volume 2* **Mathematical Analysis in Interdisciplinary Research Advanced Problems in Mathematics: Preparing for University Advanced Calculus**

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Saddle-Point Problems and Their Iterative Solution Jun 17 2021 This book provides essential lecture notes on solving large linear saddle-point systems, which arise in a wide range of applications and often pose computational challenges in science and engineering. The focus is on discussing the particular properties of such linear systems, and a large selection of algebraic methods for solving them, with an emphasis on iterative methods and preconditioning. The theoretical results presented here are complemented by a case study on potential fluid flow problem in a real world-application. This book is mainly intended for students of applied mathematics and scientific computing, but also of interest for researchers and engineers working on various

applications. It is assumed that the reader has completed a basic course on linear algebra and numerical mathematics.

A Unified Approach to Interior Point Algorithms for Linear Complementarity Problems Jun 05 2020 Following Karmarkar's 1984 linear programming algorithm, numerous interior-point algorithms have been proposed for various mathematical programming problems such as linear programming, convex quadratic programming and convex programming in general. This monograph presents a study of interior-point algorithms for the linear complementarity problem (LCP) which is known as a mathematical model for primal-dual pairs of linear programs and convex quadratic programs. A large family of potential reduction algorithms is presented in a unified way for the class of LCPs where the underlying matrix has nonnegative principal minors (P0-matrix). This class includes various important subclasses such as positive semi-definite matrices, P-matrices, P*-matrices introduced in this monograph, and column sufficient matrices. The family contains not only the usual potential reduction algorithms but also path following algorithms and a damped Newton method for the LCP. The main topics are global convergence, global linear convergence, and the polynomial-time convergence of potential reduction algorithms included in the family.

Problems in Euclidean Space Oct 29 2019 This text for advanced undergraduates and graduate students examines problems concerning convex sets in real Euclidean spaces of two or three dimensions. It illustrates the different ways in which convexity can enter into the formulation as the solution to different problems in these spaces. Problems in Euclidean Space features four chapters that develop an increasingly dominant influence of convexity. In the first chapter, convexity plays a minor role; the second chapter considers problems originally stated in a wider context that can be reduced to problems concerning convex sets. In the third chapter, the problems are defined strictly for convex sets and not for more general sets, and the final chapter discusses properties of subclasses of the class of convex sets.

Problems with a Point Nov 03 2022 Ever notice how people sometimes use math words

inaccurately? Or how sometimes you instinctively know a math statement is false (or not known)? Each chapter of this book makes a point like those above and then illustrates the point by doing some real mathematics through step-by-step mathematical techniques. This book gives readers valuable information about how mathematics and theoretical computer science work, while teaching them some actual mathematics and computer science through examples and exercises. Much of the mathematics could be understood by a bright high school student. The points made can be understood by anyone with an interest in math, from the bright high school student to a Field's medal winner.

The Math Problems Notebook Jul 19 2021 This volume offers a collection of non-trivial, unconventional problems that require deep insight and imagination to solve. They cover many topics, including number theory, algebra, combinatorics, geometry and analysis. The problems start as simple exercises and become more difficult as the reader progresses through the book to become challenging enough even for the experienced problem solver. The introductory problems focus on the basic methods and tools while the advanced problems aim to develop problem solving techniques and intuition as well as promote further research in the area. Solutions are included for each problem.

Advanced Problems in Mathematics: Preparing for University Jul 27 2019 This new and expanded edition is intended to help candidates prepare for entrance examinations in mathematics and scientific subjects, including STEP (Sixth Term Examination Paper). STEP is an examination used by Cambridge Colleges for conditional offers in mathematics. They are also used by some other UK universities and many mathematics departments recommend that their applicants practice on the past papers even if they do not take the examination. Advanced Problems in Mathematics bridges the gap between school and university mathematics, and prepares students for an undergraduate mathematics course. The questions analysed in this book are all based on past STEP questions and each question is followed by a comment and a full solution. The comments direct the reader's

attention to key points and put the question in its true mathematical context. The solutions point students to the methodology required to address advanced mathematical problems critically and independently. This book is a must read for any student wishing to apply to scientific subjects at university level and for anyone interested in advanced mathematics.

The Math Teacher's Problem-a-Day, Grades 4-8 Aug 20 2021 From bestselling authors Judith and Gary Muschla, The Math Teacher's Problem-a-Day is a hands-on resource containing 180 handy worksheets, one for each day of the school year, to help students in grades 4-8 acquire the skills needed to master mathematics. These reproducible worksheets are perfect for "sponge activities"—five-minute challenges to start or end a class period—that can also be used as supplemental lessons, homework, or extra credit. With problems based on the Standards and Focal Points of the National Council of Teachers of Mathematics, the book is designed to give students valuable practice in math skills, using specific activities to enhance critical thinking and boost test scores. The topics covered focus on the core math concepts and skills required for middle school students, including: Numbers and Operations Algebra Geometry Measurement Data Analysis Part of the 5-Minute Fundamentals series, The Math Teacher's Problem-a-Day is an important resource that will help today's students understand more concepts, make connections between branches of mathematics, and apply math skills to a variety of real-life problems.

Problems in Maths for JEE (Main & Advanced) - Volume 1 Oct 02 2022 Problems in Maths for JEE (Main & Advanced) by Career Point – Volume 1 is a collection of conceptual questions along with detailed solutions. These questions are thought-provoking and cover the application of various concepts in solving problems. Questions in this book are handpicked by experienced faculty members of Career Point to enhance the following skills of the students– 1. Understanding of concepts and their application to the grass-root level. 2. Improving their scoring ability & accuracy by providing an opportunity to practice a variety of questions. The book approaches the subject in a very conceptual and coherent manner. Chapter-wise varieties of questions are arranged in a sequential manner to build a strong foundation of fundamentals. The coverage and features of books make it highly useful for all those preparing for JEE (Main & Advanced) and aspiring to become IITians or NITians. The book is also useful for students who are preparing for KVPY and Olympiads. This volume consists of chapter wise challenging questions with detailed explanatory solutions from the following chapters for JEE- 1. Trigonometric Ratios 2. Trigonometrical Equations 3. Properties of Triangle 4. Radii of Circle 5. Logarithm & Modulus Function 6. Quadratic Equation 7. Progression 8. Binomial Theorem 9. Permutation & Combination 10. Complex Number 11. Point & Straight Line 12. Circle 13. Parabola 14. Ellipse 15. Hyperbola Highlights: Improves student's critical thinking & application of concepts in varied situations As per the requirement of JEE(Advanced) Improves self-learning hence enhances confidence and scoring ability Also useful for Olympiad and other high-level competitive exams Prepared by Career Point Kota classroom Faculty Team

Advanced Calculus Jun 25 2019 An authorised reissue of the long out of print classic textbook, Advanced Calculus by the late Dr Lynn Loomis and Dr Shlomo Sternberg both of Harvard University has been a revered but hard to find textbook for the advanced calculus course for decades. This book is based on an honors course in advanced calculus that the authors gave in the 1960's. The foundational material, presented in the unstarred sections of Chapters 1 through 11, was normally covered, but different applications of this basic material were stressed from year to year, and the book therefore contains more material than was covered in any one year. It can accordingly be used (with omissions) as a text for a year's course in advanced calculus, or as a text for a three-semester introduction to analysis. The prerequisites are a good grounding in the calculus of one variable from a mathematically rigorous point of view, together with some acquaintance with linear algebra. The reader should be familiar with limit and continuity type arguments and have a certain amount of mathematical sophistication. As possible introductory texts, we mention Differential and Integral Calculus by R Courant,

Calculus by T Apostol, Calculus by M Spivak, and Pure Mathematics by G Hardy. The reader should also have some experience with partial derivatives. In overall plan the book divides roughly into a first half which develops the calculus (principally the differential calculus) in the setting of normed vector spaces, and a second half which deals with the calculus of differentiable manifolds.

Problems in Mathematical Analysis May 17 2021 Chapter 1 poses 134 problems concerning real and complex numbers, chapter 2 poses 123 problems concerning sequences, and so it goes, until in chapter 9 one encounters 201 problems concerning functional analysis. The remainder of the book is given over to the presentation of hints, answers or referen

Numerical Solution of Two Point Boundary Value Problems Feb 11 2021 Lectures on a unified theory of and practical procedures for the numerical solution of two point boundary-value problems.

Advances in Metric Fixed Point Theory and Applications Aug 08 2020 This book collects papers on major topics in fixed point theory and its applications. Each chapter is accompanied by basic notions, mathematical preliminaries and proofs of the main results. The book discusses common fixed point theory, convergence theorems, split variational inclusion problems and fixed point problems for asymptotically nonexpansive semigroups; fixed point property and almost fixed point property in digital spaces, nonexpansive semigroups over CAT(κ) spaces, measures of noncompactness, integral equations, the study of fixed points that are zeros of a given function, best proximity point theory, monotone mappings in modular function spaces, fuzzy contractive mappings, ordered hyperbolic metric spaces, generalized contractions in b-metric spaces, multi-tupled fixed points, functional equations in dynamic programming and Picard operators. This book addresses the mathematical community working with methods and tools of nonlinear analysis. It also serves as a reference, source for examples and new approaches associated with fixed point theory and its applications for a wide audience including graduate students and researchers.

Mathematical Analysis and Applications Nov 30 2019 An authoritative text that presents the current problems, theories, and applications of mathematical analysis research Mathematical Analysis and Applications: Selected Topics offers the theories, methods, and applications of a variety of targeted topics including: operator theory, approximation theory, fixed point theory, stability theory, minimization problems, many-body wave scattering problems, Basel problem, Corona problem, inequalities, generalized normed spaces, variations of functions and sequences, analytic generalizations of the Catalan, Fuss, and Fuss–Catalan Numbers, asymptotically developable functions, convex functions, Gaussian processes, image analysis, and spectral analysis and spectral synthesis. The authors—a noted team of international researchers in the field— highlight the basic developments for each topic presented and explore the most recent advances made in their area of study. The text is presented in such a way that enables the reader to follow subsequent studies in a burgeoning field of research. This important text: Presents a wide-range of important topics having current research importance and interdisciplinary applications such as game theory, image processing, creation of materials with a desired refraction coefficient, etc. Contains chapters written by a group of esteemed researchers in mathematical analysis Includes problems and research questions in order to enhance understanding of the information provided Offers references that help readers advance to further study Written for researchers, graduate students, educators, and practitioners with an interest in mathematical analysis, Mathematical Analysis and Applications: Selected Topics includes the most recent research from a range of mathematical fields.

5-Minute Math Problem of the Day Jan 31 2020 Presents 250 multi-step math problems for students in grades four through eight, covering whole numbers, decimals, fractions, measurement, geometry, percents, ratio, and probability, and algebra and statistics; and includes an answer key.

Mathematics via Problems: Part 2: Geometry Mar 15 2021 This book is a translation from Russian of Part II of the book Mathematics Through Problems: From Olympiads and Math Circles to Profession. Part

I, Algebra, was recently published in the same series. Part III, Combinatorics, will be published soon. The main goal of this book is to develop important parts of mathematics through problems. The authors tried to put together sequences of problems that allow high school students (and some undergraduates) with strong interest in mathematics to discover and recreate much of elementary mathematics and start edging into more sophisticated topics such as projective and affine geometry, solid geometry, and so on, thus building a bridge between standard high school exercises and more intricate notions in geometry. Definitions and/or references for material that is not standard in the school curriculum are included. To help students that might be unfamiliar with new material, problems are carefully arranged to provide gradual introduction into each subject. Problems are often accompanied by hints and/or complete solutions. The book is based on classes taught by the authors at different times at the Independent University of Moscow, at a number of Moscow schools and math circles, and at various summer schools. It can be used by high school students and undergraduates, their teachers, and organizers of summer camps and math circles. In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday life, MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people, their parents and teachers, and the mathematics profession.

C++ Solutions for Mathematical Problems Nov 22 2021 The Presentation Of This Book Is On The Comprehensible Application Of Techniques For The Approximation Of The Mathematical Problems That Are Frequently Observed In Physical Sciences, Engineering Technology And Mathematical Physics. The Acceptance Of The Technique For The Solution Has Been Justified From Mathematical Point Of View. The Software Required For The Approximate Solution Of The Problems Applying The Appropriate Methods, Numerically Developed Is The Set Of Programs Written In C++ (Turbo).The Text Book Is Primarily Intended For Advanced Undergraduate And The Graduate Levels In All Branches Of Mathematical Sciences And Engineering

Technology. A Variety Of Computerised Solved Problems, Physical And Technical, Has Been Discussed In Each Chapter So That The Students Can Understand The Conceptual Text Easily.Chapter 7 On Differential Equations With Boundary Points Is Specially Focussed Because Of The Fact That A Two Point Second-Order Boundary Value Problem Is Occurred Very Often In The Field. Besides, Ordinary Differential Equations Of Any Art Have Been Presented And The Results Are Analysed Elaborately. Some Limited Examples On Partial Differential Equations Have Also Been Treated.Chapter 9 On Laplace Transforms Should Be Cordially Admitted Because An Appreciable Interest Has Been Developing In Recent Times In The Use Of Laplace Tranforms For Solving Particular Types Of Differential Equations.

Problem-Solving Strategies Sep 08 2020 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.

Problems With A Point: Exploring Math And Computer Science Jun 29 2022 Ever notice how people sometimes use math words inaccurately? Or how sometimes you instinctively know a math statement is false (or not known)?Each chapter of this book makes a point like those above and then illustrates the point by doing some real mathematics through step-by-step mathematical techniques.This book gives readers valuable information about how mathematics and

theoretical computer science work, while teaching them some actual mathematics and computer science through examples and exercises. Much of the mathematics could be understood by a bright high school student. The points made can be understood by anyone with an interest in math, from the bright high school student to a Field's medal winner.

Change-point Problems Mar 27 2022
The Ultimate Challenge Apr 03 2020 The $3x 1$ problem, or Collatz problem, concerns the following seemingly innocent arithmetic procedure applied to integers: If an integer x is odd then ""multiply by three and add one"", while if it is even then ""divide by two"". The $3x 1$ problem asks whether, starting from any positive integer, repeating this procedure over and over will eventually reach the number 1. Despite its simple appearance, this problem is unsolved. Generalizations of the problem are known to be undecidable, and the problem itself is believed to be extraordinarily difficult. This book reports on what is known on this problem. It consists of a collection of papers, which can be read independently of each other. The book begins with two introductory papers, one giving an overview and current status, and the second giving history and basic results on the problem. These are followed by three survey papers on the problem, relating it to number theory and dynamical systems, to Markov chains and ergodic theory, and to logic and the theory of computation. The next paper presents results on probabilistic models for behavior of the iteration. This is followed by a paper giving the latest computational results on the problem, which verify its truth for $x

Current Problems of Mathematics Apr 15 2021
Mathematics via Problems Jan 13 2021 This book is a translation from Russian of Part I of the book Mathematics Through Problems: From Olympiads and Math Circles to Profession. The other two parts, Geometry and Combinatorics, will be published soon. The main goal of this book is to develop important parts of mathematics through problems. The author tries to put together sequences of problems that allow high school students (and some undergraduates) with strong interest in mathematics to discover and recreate much of elementary mathematics

and start edging into the sophisticated world of topics such as group theory, Galois theory, and so on, thus building a bridge (by showing that there is no gap) between standard high school exercises and more intricate and abstract concepts in mathematics. Definitions and/or references for material that is not standard in the school curriculum are included. However, many topics in the book are difficult when you start learning them from scratch. To help with this, problems are carefully arranged to provide gradual introduction into each subject. Problems are often accompanied by hints and/or complete solutions The book is based on classes taught by the author at different times at the Independent University of Moscow, at a number of Moscow schools and math circles, and at various summer schools. It can be used by high school students and undergraduates, their teachers, and organizers of summer camps and math circles. In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday life, MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people, their parents and teachers, and the mathematics profession.
Mathematical Analysis in Interdisciplinary Research Aug 27 2019 This contributed volume provides an extensive account of research and expository papers in a broad domain of mathematical analysis and its various applications to a multitude of fields. Presenting the state-of-the-art knowledge in a wide range of topics, the book will be useful to graduate students and researchers in theoretical and applicable interdisciplinary research. The focus is on several subjects including: optimal control problems, optimal maintenance of communication networks, optimal emergency evacuation with uncertainty, cooperative and noncooperative partial differential systems, variational inequalities and general equilibrium models, anisotropic elasticity and harmonic functions, nonlinear stochastic differential equations, operator equations, max-product operators of Kantorovich type, perturbations of operators, integral operators, dynamical systems involving maximal monotone operators, the three-body problem, deceptive systems, hyperbolic equations, strongly generalized

preinvex functions, Dirichlet characters, probability distribution functions, applied statistics, integral inequalities, generalized convexity, global hyperbolicity of spacetimes, Douglas-Rachford methods, fixed point problems, the general Rodrigues problem, Banach algebras, affine group, Gibbs semigroup, relator spaces, sparse data representation, Meier-Keeler sequential contractions, hybrid contractions, and polynomial equations. Some of the works published within this volume provide as well guidelines for further research and proposals for new directions and open problems.
Problems in Maths for JEE (Main & Advanced) - Volume 2 Sep 28 2019 Problems in Maths for JEE (Main & Advanced) by Career Point – Volume 2 is a collection of conceptual questions along with detailed solutions. These questions are thought-provoking and cover the application of various concepts in solving problems. Questions in this book are handpicked by experienced faculty members of Career Point to enhance the following skills of the students– 1. Understanding of concepts and their application to the grass-root level. 2. Improving their scoring ability & accuracy by providing an opportunity to practice a variety of questions. The book approaches the subject in a very conceptual and coherent manner. Chapter-wise varieties of questions are arranged in a sequential manner to build a strong foundation of fundamentals. The coverage and features of books make it highly useful for all those preparing for JEE (Main & Advanced) and aspiring to become IITians or NITians. The book is also useful for students who are preparing for KVPY and Olympiads. This volume consists of chapter wise challenging questions with detailed explanatory solutions from the following chapters for JEE- 1. Function 2. Inverse Trigonometric Functions 3. Limit 4. Continuity 5. Differentiation 6. Application of Derivatives # 1 (Tangent & Normal) 7. Application of Derivatives # 2 (Monotonicity) 8. Application of Derivatives # 3 (Maxima & Minima) 9. Indefinite Integration 10. Definite Integration 11. Area Under the Curve 12. Differential Equation 13. Probability 14. Determinants 15. Matrices 16. Vector 17. Three Dimensional Geometry (3D) Highlights: Improves student's critical thinking & application of concepts in varied situations As per the requirement of JEE(Advanced) Improves self-learning hence enhances confidence and scoring ability Also useful for Olympiad and other high-level competitive exams Prepared by Career Point Kota classroom Faculty Team **Critical Point Theory** Jul 07 2020 This monograph collects cutting-edge results and techniques for solving nonlinear partial differential equations using critical points. Including many of the author's own contributions, a range of proofs are conveniently collected here, Because the material is approached with rigor, this book will serve as an invaluable resource for exploring recent developments in this active area of research, as well as the numerous ways in which critical point theory can be applied. Different methods for finding critical points are presented in the first six chapters. The specific situations in which these methods are applicable is explained in detail. Focus then shifts toward the book's main subject: applications to problems in mathematics and physics. These include topics such as Schrödinger equations, Hamiltonian systems, elliptic systems, nonlinear wave equations, nonlinear optics, semilinear PDEs, boundary value problems, and equations with multiple solutions. Readers will find this collection of applications convenient and thorough, with detailed proofs appearing throughout. Critical Point Theory will be ideal for graduate students and researchers interested in solving differential equations, and for those studying variational methods. An understanding of fundamental mathematical analysis is assumed. In particular, the basic properties of Hilbert and Banach spaces are used. **Challenging Mathematical Problems with Elementary Solutions, Vol. I** Feb 23 2022 Designed for advanced high school students, undergraduates, graduate students, mathematics teachers, and any lover of mathematical challenges, this two-volume set offers a broad spectrum of challenging problems — ranging from relatively simple to extremely difficult. Indeed, some rank among the finest achievements of outstanding mathematicians. Translated from a well-known Russian work entitled Non-Elementary Problems in an Elementary Exposition, the chief aim of the book is to acquaint the readers with a variety of new

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mathematical facts, ideas, and methods. And while the majority of the problems represent questions in higher ("non-elementary") mathematics, most can be solved with elementary mathematics. In fact, for the most part, no knowledge of mathematics beyond a good high school course is required. Volume One contains 100 problems, with detailed solutions, all dealing with probability theory and combinatorial analysis. Topics include the representation of integers as sums and products, combinatorial problems on the chessboard, geometric problems on combinatorial analysis, problems on the binomial coefficients, problems on computing probabilities, experiments with infinitely many possible outcomes, and experiments with a continuum of possible outcomes. Volume Two contains 74 problems from various branches of mathematics, dealing with such topics as points and lines, lattices of points in the plane, topology, convex polygons, distribution of objects, nondecimal counting, theory of primes, and more. In both volumes the statements of the problems are given first, followed by a section giving complete solutions. Answers and hints are given at the end of the book. Ideal as a text, for self-study, or as a working resource for a mathematics club, this wide-ranging compilation offers 174 carefully chosen problems that will test the mathematical acuity and problem-solving skills of almost any student, teacher, or mathematician.

Nonparametric Methods in Change Point Problems Oct 10 2020 The explosive development of information science and technology puts in new problems involving statistical data analysis. These problems result from higher re quirements concerning the reliability of statistical decisions, the accuracy of math ematical models and the quality of control in complex systems. A new aspect of statistical analysis has emerged, closely connected with one of the basic questions of cynergetics: how to "compress" large volumes of experimental data in order to extract the most valuable information from data observed. De tection of large "homogeneous" segments of data enables one to identify "hidden" regularities in an object's behavior, to create mathematical models for each seg ment of homogeneity, to choose an appropriate control, etc. Statistical methods dealing with the detection of changes in the characteristics of random processes can be of great use in all these problems. These methods have accompanied the rapid growth in data beginning from the middle of our century. According to a tradition of more than thirty years, we call this sphere of statistical analysis the "theory of change-point detection. " During the last fifteen years, we have witnessed many exciting developments in the theory of change-point detection. New promising directions of research have emerged, and traditional trends have flourished anew. Despite this, most of the results are widely scattered in the literature and few monographs exist. A real need has arisen for up-to-date books which present an account of important current research trends, one of which is the theory of non parametric change--point detection.

Turning Points in the History of Mathematics Jan 25 2022 This book explores some of the major turning points in the history of mathematics, ranging from ancient Greece to the present, demonstrating the drama that has often been a part of its evolution. Studying these breakthroughs, transitions, and revolutions, their stumbling-blocks and their triumphs, can help illuminate the importance of the history of mathematics for its teaching, learning, and appreciation. Some of the turning points considered are the rise of the axiomatic method (most famously in Euclid), and the subsequent major changes in it (for example, by David Hilbert); the "wedding," via analytic geometry, of algebra and geometry; the "taming" of the infinitely small and the infinitely large; the passages from algebra to algebras, from geometry to geometries, and from arithmetic to arithmetics; and the revolutions in the late nineteenth and early twentieth centuries that resulted from Georg Cantor's creation of transfinite set theory. The origin of each turning point is discussed, along with the mathematicians involved and some of the mathematics that resulted. Problems and projects are included in each chapter to extend and increase understanding of the material. Substantial reference lists are also provided. Turning Points in the History of Mathematics will be a valuable resource for teachers of, and students in, courses in mathematics or its

history. The book should also be of interest to anyone with a background in mathematics who wishes to learn more about the important moments in its development.

100 Great Problems of Elementary Mathematics Dec 24 2021 Problems that beset Archimedes, Newton, Euler, Cauchy, Gauss, etc. Features squaring the circle, pi, similar problems. No advanced math is required. Includes 100 problems with proofs.

40 Puzzles and Problems in Probability and Mathematical Statistics Mar 03 2020 This book is based on the view that cognitive skills are best acquired by solving challenging, non-standard probability problems. Many puzzles and problems presented here are either new within a problem solving context (although as topics in fundamental research they are long known) or are variations of classical problems which follow directly from elementary concepts. A small number of particularly instructive problems is taken from previous sources which in this case are generally given. This book will be a handy resource for professors looking for problems to assign, for undergraduate math students, and for a more general audience of amateur scientists.

One Hundred Problems in Elementary Mathematics Dec 12 2020 Both a challenge to mathematically inclined readers and a useful supplementary text for high school and college courses, One Hundred Problems in Elementary Mathematics presents an instructive, stimulating collection of problems. Many problems address such matters as numbers, equations, inequalities, points, polygons, circles, ellipses, space, polyhedra, and spheres. An equal number deal with more amusing or more practical subjects, such as a picnic ham, blood groups, rooks on a chessboard, and the doings of the ingenious Dr. Abracadabrus. Are the problems in this book really elementary? Perhaps not in the lay reader's sense, for anyone who desires to solve these problems must know a fair amount of mathematics, up to calculus. Nevertheless, Professor Steinhaus has given complete, detailed solutions to every one of his 100 problems, and anyone who works through the solutions will painlessly learn an astonishing amount of mathematics. A final chapter provides a true test for the most proficient readers: 13 additional

unsolved problems, including some for which the author himself does not know the solutions. **Berkeley Problems in Mathematics** May 29 2022 This book collects approximately nine hundred problems that have appeared on the preliminary exams in Berkeley over the last twenty years. It is an invaluable source of problems and solutions. Readers who work through this book will develop problem solving skills in such areas as real analysis, multivariable calculus, differential equations, metric spaces, complex analysis, algebra, and linear algebra.

How to Solve It Apr 27 2022 A perennial bestseller by eminent mathematician G. Polya, How to Solve It will show anyone in any field how to think straight. In lucid and appealing prose, Polya reveals how the mathematical method of demonstrating a proof or finding an unknown can be of help in attacking any problem that can be "reasoned" out—from building a bridge to winning a game of anagrams. Generations of readers have relished Polya's deft—indeed, brilliant—instructions on stripping away irrelevancies and going straight to the heart of the problem.

Nonparametric Methods in Change Point Problems May 05 2020 The explosive development of information science and technology puts in new problems involving statistical data analysis. These problems result from higher re quirements concerning the reliability of statistical decisions, the accuracy of math ematical models and the quality of control in complex systems. A new aspect of statistical analysis has emerged, closely connected with one of the basic questions of cynergetics: how to "compress" large volumes of experimental data in order to extract the most valuable information from data observed. De tection of large "homogeneous" segments of data enables one to identify "hidden" regularities in an object's behavior, to create mathematical models for each seg ment of homogeneity, to choose an appropriate control, etc. Statistical methods dealing with the detection of changes in the characteristics of random processes can be of great use in all these problems. These methods have accompanied the rapid growth in data beginning from the middle of our century. According to a tradition of more than thirty

years, we call this sphere of statistical analysis the "theory of change-point detection. " During the last fifteen years, we have witnessed many exciting developments in the theory of change-point detection. New promising directions of research have emerged, and traditional trends have flourished anew. Despite this, most of the results are widely scattered in the literature and few monographs exist. A real need has arisen for up-to-date books which present an account of important current research trends, one of which is the theory of non parametric change--point detection.

Open Middle Math Sep 20 2021 Imagine that you assign a math problem and your students, instead of getting discouraged after not solving it on the first attempt, start working harder--as if on a quest to figure out the answer. They talk to each other and enthusiastically share their discoveries. What could possibly make this fantastic scenario come true? The answer is: the Open Middle math problems and strategies in this book. Open Middle Math by Robert Kaplinsky gives middle and high school teachers the problems and planning guidance that will encourage students to see mathematics in an entirely different light. These challenging and rewarding Open Middle math problems will help you see your students build genuine conceptual understanding, perseverance, and creativity. Inside, you'll learn how to: Implement Open Middle math problems that are simultaneously accessible for both students who are struggling and those looking for more challenge. Select and create Open Middle math problems that will help you detect students' misconceptions and strengthen their conceptual understanding. Prepare for and facilitate powerful classroom conversations using Open Middle math problems. Access resources that will help you continue learning beyond this book. With these practical and intuitive strategies, extensive resources, and Robert's own stories about his journey learning to use Open Middle math problems successfully, you will be able to support, challenge, and motivate all your students.

Problem-Solving Strategies Oct 22 2021 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.

Iterative Methods for Fixed Point Problems in Hilbert Spaces Sep 01 2022 Iterative methods for finding fixed points of non-expansive operators in Hilbert spaces have been described in many publications. In this monograph we try to present the methods in a consolidated way. We introduce several classes of operators, examine their properties, define iterative methods generated by operators from these classes and present general convergence theorems. On this basis we discuss the conditions under which particular methods converge. A large part of the results presented in this monograph can be found in various forms in the literature (although several results presented here are new). We have tried, however, to show that the convergence of a large class of iteration methods follows from general properties of some classes of operators and from some general convergence theorems.

Advanced Problems in Mathematics Nov 10 2020 This new and expanded edition is intended to help candidates prepare for entrance examinations in mathematics and scientific subjects, including STEP (Sixth Term Examination Paper). STEP is an examination used by Cambridge Colleges for conditional offers in mathematics. They are also used by some other UK universities and many mathematics departments recommend that their applicants practice on the past papers even if they do not take the examination. Advanced

Problems in Mathematics bridges the gap between school and university mathematics, and prepares students for an undergraduate mathematics course. The questions analysed in this book are all based on past STEP questions and each question is followed by a comment and a full solution. The comments direct the reader's attention to key points and put the question in its true mathematical context. The solutions point students to the methodology required to address advanced mathematical problems critically and independently. This book is a must read for any student wishing to apply to scientific subjects at university level and for anyone interested in advanced mathematics.

Mathematical Problem Solving Jan 01 2020 This book is addressed to people with research interests in the nature of mathematical thinking at any level, to people with an interest in "higher-order thinking skills" in any domain, and to all mathematics teachers. The focal point of the book is a framework for the analysis of complex problem-solving behavior. That framework is presented in Part One, which consists of Chapters 1 through 5. It describes four qualitatively different aspects of complex intellectual activity: cognitive resources, the body of facts and procedures at one's disposal; heuristics, "rules of thumb" for making progress in difficult situations; control, having to do with the efficiency with which individuals utilize the knowledge at their disposal; and belief systems, one's perspectives regarding the nature of a discipline and how one goes about working in it. Part Two of the book, consisting of Chapters 6 through 10, presents a series of empirical studies that flesh out the analytical framework. These studies document the ways that competent problem solvers make the most of the knowledge at their disposal. They include observations of students, indicating some typical roadblocks to success. Data taken from students before and after a series of intensive problem-solving courses document the kinds of learning that can result from carefully designed instruction. Finally, observations made in typical high school classrooms serve to indicate some of the sources of students' (often counterproductive) mathematical behavior.

Advanced Problems in Mathematics: Preparing for University Jul 31 2022 This book is intended to help candidates prepare for entrance examinations in mathematics and scientific subjects, including STEP (Sixth Term Examination Paper). STEP is an examination used by Cambridge colleges as the basis for conditional offers. They are also used by Warwick University, and many other mathematics departments recommend that their applicants practice on the past papers even if they do not take the examination. Advanced Problems in Mathematics is recommended as preparation for any undergraduate mathematics course, even for students who do not plan to take the Sixth Term Examination Paper. The questions analysed in this book are all based on recent STEP questions selected to address the syllabus for Papers I and II, which is the A-level core (i.e. C1 to C4) with a few additions. Each question is followed by a comment and a full solution. The comments direct the reader's attention to key points and put the question in its true mathematical context. The solutions point students to the methodology required to address advanced mathematical problems critically and independently. This book is a must read for any student wishing to apply to scientific subjects at university level and for anybody interested in advanced mathematics.