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Mathematical Tools for the Study of the Incompressible Navier-Stokes Equations andRelated Models - Franck Boyer 2012-11-06 The objective of this self-contained book is two-fold. First, the reader is introduced to the modelling and mathematical analysis used in fluid mechanics, especially concerning the Navier-Stokes equations which is the basic model for the flow of incompressible viscous fluids. Authors introduce mathematical tools so that the reader is able to use them for studying many other kinds of partial differential equations, in particular nonlinear evolution problems. The background needed are basic results in calculus, integration, and functional analysis. Some sections certainly contain more advanced topics

than others. Nevertheless, the authors' aim is that graduate or PhD students, as well as researchers who are not specialized in nonlinear analysis or in mathematical fluid mechanics, can find a detailed introduction to this subject. .

Curvature and Homology - 2011-08-29
Curvature and Homology

Graphs and Questionnaires - 1980-01-01
Graphs and Questionnaires

Bulletin (new Series) of the American Mathematical Society - 1913

Handbook on the History of Mathematics Education - Alexander Karp 2014-01-25
This is the first comprehensive International Handbook on the History of Mathematics Education, covering a wide spectrum of epochs and civilizations, countries and cultures. Until now, much of the research into the rich and varied history of mathematics education has remained inaccessible to the vast majority of scholars, not least because it has been written in the language, and for readers, of an individual country. And yet a historical overview, however brief, has become an indispensable element of nearly every dissertation and scholarly article. This handbook provides, for the first time, a comprehensive and systematic aid for researchers around the world in finding the information they need about historical developments in mathematics education, not only in their own countries, but globally as well. Although written primarily for mathematics educators, this handbook will also be of interest to researchers of the history of education in general, as well as specialists in cultural and even social history.

Mathematical Topics in Fluid Mechanics - Jose Francisco Rodrigues 2020-10-02
This Research Note presents several contributions and mathematical studies in fluid mechanics, namely in non-Newtonian and viscoelastic fluids and on the Navier-Stokes equations in unbounded domains. It includes

review of the mathematical analysis of incompressible and compressible flows and results in magnetohydrodynamic and electrohydrodynamic stability and thermoconvective flow of Boussinesq-Stefan type. These studies, along with brief communications on a variety of related topics comprise the proceedings of a summer course held in Lisbon, Portugal in 1991. Together they provide a set of comprehensive survey and advanced introduction to problems in fluid mechanics and partial differential equations.

Handbook of Mathematics - Thierry Vialar 2016-12-07

The book consists of XI Parts and 28 Chapters covering all areas of mathematics. It is a tool for students, scientists, engineers, students of many disciplines, teachers, professionals, writers and also for a general reader with an interest in mathematics and in science. It provides a wide range of mathematical concepts, definitions, propositions, theorems, proofs, examples, and numerous illustrations. The difficulty level can vary depending on chapters, and sustained attention will be required for some. The structure and list of Parts are quite classical: I. Foundations of Mathematics, II. Algebra, III. Number Theory, IV. Geometry, V. Analytic Geometry, VI. Topology, VII .Algebraic Topology, VIII. Analysis, IX. Category Theory, X. Probability and Statistics, XI. Applied Mathematics. Appendices provide useful lists of symbols and tables for ready reference. The publisher's hope is that this book, slightly revised and in a convenient format, will serve the needs of readers, be it for study, teaching, exploration, work, or research.

Mechanics and Mathematics of Fluids of the Differential Type - D. Cioranescu 2016-07-29

This text is the first of its kind to bring together both the thermomechanics and mathematical analysis of Reiner-Rivlin fluids and fluids of grades 2 and 3 in a single book. Each part of the book can be considered as being self-contained. The first part of the book is devoted to a

description of the mechanics, thermodynamics, and stability of flows of fluids of grade 2 and grade 3. The second part of the book is dedicated to the development of rigorous mathematical results concerning the equations governing the motion of a family of fluids of the differential type. Finally, the proofs of a number of useful results are collected in an appendix.
Computation and Applied Mathematics - 1999

Optimal Control from Theory to Computer Programs - Viorel Arnăutu 2013-04-17
The aim of this book is to present the mathematical theory and the know-how to make computer programs for the numerical approximation of Optimal Control of PDE's. The computer programs are presented in a straightforward generic language. As a consequence they are well structured, clearly explained and can be translated easily into any high level programming language. Applications and corresponding numerical tests are also given and discussed. To our knowledge, this is the first book to put together mathematics and computer programs for Optimal Control in order to bridge the gap between mathematical abstract algorithms and concrete numerical ones. The text is addressed to students and graduates in Mathematics, Mechanics, Applied Mathematics, Numerical Software, Information Technology and Engineering. It can also be used for Master and Ph.D. programs.
Revue Roumaine de Mathématiques Pures Et Appliquées - 1997

Asymptotic Analysis for Periodic Structures - Alain Bensoussan 2011-10-26
This is a reprinting of a book originally published in 1978. At that time it was the first book on the subject of homogenization, which is the asymptotic analysis of partial differential equations with rapidly oscillating coefficients, and as such it sets the stage for what problems to consider and what methods to use, including

probabilistic methods. At the time the book was written the use of asymptotic expansions with multiple scales was new, especially their use as a theoretical tool, combined with energy methods and the construction of test functions for analysis with weak convergence methods. Before this book, multiple scale methods were primarily used for non-linear oscillation problems in the applied mathematics community, not for analyzing spatial oscillations as in homogenization. In the current printing a number of minor corrections have been made, and the bibliography was significantly expanded to include some of the most important recent references. This book gives systematic introduction of multiple scale methods for partial differential equations, including their original use for rigorous mathematical analysis in elliptic, parabolic, and hyperbolic problems, and with the use of probabilistic methods when appropriate. The book continues to be interesting and useful to readers of different backgrounds, both from pure and applied mathematics, because of its informal style of introducing the multiple scale methodology and the detailed proofs.

Properties of Global Attractors of Partial Differential Equations - Anatoliĭ Vladimirovich Babin 1992

Mathématiques Ma - Loïc Teyssier 2017-05-24

En couleurs et très illustré, ce manuel a été conçu pour vous qui débutez un cursus scientifique universitaire. Il vous permettra d'acquérir les connaissances fondamentales en mathématiques, mais aussi la démarche et la rigueur scientifiques indispensables aux études supérieures. De multiples rubriques vous garantissent un apprentissage progressif et complet : un cours visuel avec de nombreux exemples concrets pour introduire et illustrer les notions et concepts clés ; des encadrés méthodologiques pour vous guider vers les bonnes pratiques ; des focus sur des applications, sujets de recherche ou thèmes

d'actualité; des repères historiques ; de nombreux QCM et exercices (tous corrigés) pour tester vos acquis et vous entraîner.

Analysis, Manifolds and Physics Revised Edition - Yvonne Choquet-Bruhat 1982

This reference book, which has found wide use as a text, provides an answer to the needs of graduate physical mathematics students and their teachers. The present edition is a thorough revision of the first, including a new chapter entitled ``Connections on Principle Fibre Bundles'' which includes sections on holonomy, characteristic classes, invariant curvature integrals and problems on the geometry of gauge fields, monopoles, instantons, spin structure and spin connections. Many paragraphs have been rewritten, and examples and exercises added to ease the study of several chapters. The index includes over 130 entries.

Problem Solving in the Mathematics Classroom - Ana Kuzle 2016-06-30

Problem solving is a cornerstone of the school mathematics curricula in many countries, as it is an essential part of mathematical knowledge and performance. Implementation of problem solving in school mathematics is also important for meeting society's needs with respect to work, school, and life – as well as for stimulating the interest and enthusiasm of students. Countries such as Finland, Germany, Hungary, and Slovenia have a long tradition of problem solving in school mathematics. Each country has faced its own specific challenges when adopting problem solving as a constituent part of school mathematics. But through this process they have gained experience and discovered chances for integrating problem solving into mathematics lessons. The heart of achieving this mission lies in choosing good mathematical problems. Good mathematical problems are those that are not too difficult and not too easy, are interesting, challenging, and mathematically rich. They should invite students to conjecture and to explore different strategies, support extending

their existing knowledge, and allow for problem extension. In this book, the reader will find such rich mathematical problems – targeting students at different school levels – that can help cultivate a problem solving culture. The book provides the coherence and direction from different perspectives that practitioners need when integrating problem solving into their teaching practices and using problem solving to teach mathematics. We believe, that the processes which accompany problem solving, contribute to both the development of students' mathematical reasoning and to the development of their sense of autonomy.

Mathematical and Numerical Foundations of Turbulence Models and Applications - Tomás Chacón Rebollo 2014-06-17

With applications to climate, technology, and industry, the modeling and numerical simulation of turbulent flows are rich with history and modern relevance. The complexity of the problems that arise in the study of turbulence requires tools from various scientific disciplines, including mathematics, physics, engineering and computer science. Authored by two experts in the area with a long history of collaboration, this monograph provides a current, detailed look at several turbulence models from both the theoretical and numerical perspectives. The k-epsilon, large-eddy simulation and other models are rigorously derived and their performance is analyzed using benchmark simulations for real-world turbulent flows. Mathematical and Numerical Foundations of Turbulence Models and Applications is an ideal reference for students in applied mathematics and engineering, as well as researchers in mathematical and numerical fluid dynamics. It is also a valuable resource for advanced graduate students in fluid dynamics, engineers, physical oceanographers, meteorologists and climatologists.

Catalog of Copyright Entries. Third Series - Library of Congress. Copyright Office 1974

Integer and Mixed Programming: Theory and Applications - Henry-Laborde?Re 1977-11-23
Integer and Mixed Programming: Theory and Applications
What Is a Quantum Field Theory? - Michel Talagrand 2022-03-17
A lively and erudite introduction for readers with a background in undergraduate mathematics but no previous knowledge of physics.
Bulletin of the American Mathematical Society - American Mathematical Society 1909

Changing Images in Mathematics - Umberto Bottazzini 2001
This book focuses on some of the major developments in the history of contemporary (19th and 20th century) mathematics as seen in the broader context of the development of science and culture. Avoiding technicalities, it displays the breadth of contrasting images of mathematics favoured by different countries, schools and historical movements, showing how the conception and practice of mathematics changed over time depending on the cultural and national context. Thus it provides an original perspective for embracing the richness and variety inherent in the development of mathematics. Attention is paid to the interaction of mathematics with themes whose proper treatment have been neglected by the traditional historiography of the discipline, such as the relationship between mathematics, statistics and medicine.
Canadian Mathematical Bulletin - 1968

Image Analysis and Recognition - Aurelio Campilho 2012-06-21
The two-volume set LNCS 7324/7325 constitutes the refereed proceedings of the 9th International Conference on Image and Recognition, ICIAR 2012, held in Aveiro, Portugal, in June 2012. The 107 revised full papers presented were carefully reviewed and selected from 207 submissions. The papers are organized in topical sections on

clustering and classification; image processing; image analysis; motion analysis and tracking; shape representation; 3D imaging; applications; biometrics and face recognition; human activity recognition; biomedical image analysis; retinal image analysis; and call detection and modeling.

Frontiers in Mathematical Analysis and Numerical Methods - Jacques-Louis Lions 2004

This volume is a collection of articles in memory of Jacques-Louis Lions, a leading mathematician and the founder of the Contemporary French Applied Mathematics School. The contributions have been written by his friends, colleagues and students. The book concerns many important results in analysis, geometry, numerical methods, fluid mechanics, control theory, etc.

Mathematical Basis of Statistics - Jean-René Barra 2014-05-10

Mathematical Basis of Statistics provides information pertinent to the methods and the mathematical basis of statistics. This book discusses the fundamental notion of statistical space. Organized into 12 chapters, this book begins with an overview of the notion of statistical space in mathematical statistics and discusses other analogies with probability theory. This text then presents the notions of sufficiency and freedom, which are fundamental and useful in statistics but do not correspond to any notion in probability theory. Other chapters consider the theory of nonsequential tests and explain the practical meaning of the mathematical tools employed in statistics. This book discusses as well distributions used most frequently in classical statistical problems based on the normal distribution and provides relationships among these distributions. The final chapter deals with certain problems of mathematical statistics that are related to various problems of functional analysis. This book is a valuable resource for graduate and postgraduate students.

Maths - François Liret 1983

Ce tome 2 couvre le programme du 2e semestre de la première année d'enseignement supérieur-

où note héros - l'étudiant en sciences de 1ère année s'attaquera à 56 nouvelles leçons... toujours constituées de courts chapitres correspondant à une journée de travail et assorties d'exemples et d'exercices, de rappels, de conseils... et, à l'issue du 2e semestre, réussira à ses examens... s'il a suffisamment travaillé !

Variational and Quasi-Variational Inequalities in Mechanics - Alexander S. Kravchuk 2007-09-04

The essential aim of this book is to consider a wide set of problems arising in the mathematical modeling of mechanical systems under unilateral constraints. In these investigations elastic and non-elastic deformations, friction and adhesion phenomena are taken into account. All the necessary mathematical tools are given: local boundary value problem formulations, construction of variational equations and inequalities and their transition to minimization problems, existence and uniqueness theorems, and variational transformations (Friedrichs and Young-Fenchel-Moreau) to dual and saddle-point search problems.

Mathematical Methods for the Magnetohydrodynamics of Liquid Metals - Jean-Frédéric Gerbeau 2006-08-31

Aimed at research mathematicians, engineers and physicists, as well as those in industry, the approach of this text is highly mathematical and based on solid numerical analysis. It focuses on mathematical and numerical techniques for the simulation of magnetohydrodynamic phenomena, with an emphasis on industrial applications.

Computation and Applied Mathematics - 2002

Dynamical Systems IV - S.P. Novikov 2001-06-20

From the reviews of the first edition:"... Here ... a wealth of material is displayed for us, too much to even indicate in a review. ... Your reviewer was very impressed by the contents of both volumes (EMS 2 and 4), recommending them without any

restriction." Mededelingen van het Wiskundig genootshap 1992

Mathematical Structures and Mathematical Modelling - Isaak Moiseevich ÎAglom 1986

A substantial amount of this book is devoted to general questions (including significant material from the history of science, allowing one to follow the formation of modern attitudes on the essence of mathematics and the methods of its applications): only chapters 5 and 6 are devoted to a survey of the basic algebraic structures and a more detailed analysis of a structure associated with some geometric considerations, are of a more concrete character.

The Maslov Index in Symplectic Banach Spaces - Bernhelm Booß-Bavnbek 2018-03-19

The authors consider a curve of Fredholm pairs of Lagrangian subspaces in a fixed Banach space with continuously varying weak symplectic structures. Assuming vanishing index, they obtain intrinsically a continuously varying splitting of the total Banach space into pairs of symplectic subspaces. Using such decompositions the authors define the Maslov index of the curve by symplectic reduction to the classical finite-dimensional case. The authors prove the transitivity of repeated symplectic reductions and obtain the invariance of the Maslov index under symplectic reduction while recovering all the standard properties of the Maslov index. As an application, the authors consider curves of elliptic operators which have varying principal symbol, varying maximal domain and are not necessarily of Dirac type. For this class of operator curves, the authors derive a desuspension spectral flow formula for varying well-posed boundary conditions on manifolds with boundary and obtain the splitting formula of the spectral flow on partitioned manifolds.

Canadian Mathematical Bulletin - 1968

Geometric Asymptotics - Victor Guillemin 1990

Symplectic geometry and the theory of Fourier integral operators are modern manifestations of

themes that have occupied a central position in mathematical thought for the past three hundred years - the relations between the wave and the corpuscular theories of light. The purpose of this book is to develop these themes, and present some of the recent advances, using the language of differential geometry as a unifying influence.
International Mathematical News - 1973

A Complex Analysis Problem Book - Daniel Alpay 2016-10-26
This second edition presents a collection of exercises on the theory of analytic functions, including completed and detailed solutions. It introduces students to various applications and aspects of the theory of analytic functions not always touched on in a first course, while also addressing topics of interest to electrical engineering students (e.g., the realization of rational functions and its connections to the theory of linear systems and state space representations of such systems). It provides examples of important Hilbert spaces of analytic functions (in particular the Hardy space and the Fock space), and also includes a section reviewing essential aspects of topology, functional analysis and Lebesgue integration. Benefits of the 2nd edition Rational functions are now covered in a separate chapter. Further, the section on conformal mappings has been expanded.

Domain Decomposition Methods - Algorithms and Theory - Andrea Toselli 2004-10-18
This book offers a comprehensive presentation of some of the most successful and popular domain decomposition preconditioners for finite and spectral element approximations of partial differential equations. It places strong emphasis on both algorithmic and mathematical aspects. It covers in detail important methods such as FETI and balancing Neumann-Neumann methods and algorithms for spectral element methods.
Canadian Mathematical Bulletin - 1968

Computational Turbulent Incompressible Flow - Johan Hoffman 2007-02-13

This is Volume 4 of the book series of the Body and Soul mathematics education reform program. It presents a unified new approach to computational simulation of turbulent flow starting from the general basis of calculus and linear algebra of Vol 1-3. The book puts the Body and Soul computational finite element methodology in the form of General Galerkin (G2) up against the challenge of computing turbulent solutions of the inviscid Euler equations and the Navier-Stokes equations with small viscosity. This is an outstanding textbook presenting plenty of new material with an excellent pedagogical approach.