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Principles of Topology Basic Concepts of Algebraic Topology An Illustrated Introduction to Topology and Homotopy Basic Topology Topology of Surfaces *Measure, Topology, and Fractal Geometry* Basic Algebraic Topology and its Applications Differentialgeometrie, Topologie und Physik *A First Course in Geometric Topology and Differential Geometry* **Topological Spaces Topological and Uniform Spaces** *Who's who in Technology Today* Basic Concepts of Algebraic Topology **Inverse Limits Lie-Gruppen und Lie-Algebren in der Physik** *I-Density Continuous Functions* Deutsche Bibliographie **Functions of Several Variables** *Mathematics and Its History* **Applied Linear Algebra and Matrix Analysis** *Geometry, Topology and Physics* Foundations of Topology *Linear Algebra Through Geometry* **Mathematical Reflections An Introduction to Complex Function Theory Variational Calculus and Optimal Control** *Ideals, Varieties, and Algorithms* Elementary Topics in Differential Geometry **Second Year Calculus An Introduction to Difference Equations Discrete Probability** *Rings, Fields, and Vector Spaces Introduction to Optimal Control Theory* **Differential Forms in Algebraic Topology** Introduction to Calculus and Classical Analysis **Topics in Physical Mathematics The Heritage of Thales Numerical Mathematics** An Introduction to Probabilistic Modeling *Understanding Meaningful Environments*

Topological Spaces Jan 27 2022 gentle introduction to the subject, leading the reader to understand the notion of what is important in topology with regard to geometry. Divided into three sections - The line and the plane, Metric spaces and Topological spaces -, the book eases the move into higher levels of abstraction. Students are thereby informally assisted in learning new ideas while remaining on familiar territory. The authors do not assume previous knowledge of axiomatic approach or set theory. Similarly, they have restricted the mathematical vocabulary in the book so as to avoid overwhelming the reader, and the concept of convergence is employed to allow students to focus on a central theme while moving to a natural understanding of the notion of topology. The pace of the book is relaxed with gradual acceleration: the first nine sections form a balanced course in metric spaces for undergraduates while also containing ample material for a two-semester graduate course. Finally, the book illustrates the many connections between topology and other subjects, such as analysis and set theory, via the inclusion of "Extras" at the end of each chapter presenting a brief foray outside topology.

Numerical Mathematics Aug 29 2019 "In truth, it is not knowledge, but learning, not possessing, but production, not being there, but travelling there, which provides the greatest pleasure. When I have completely understood something, then I turn away and move on into the dark; indeed, so curious is the insatiable man, that when he has completed one house, rather than living in it peacefully, he starts to build another. " Letter from C. F. Gauss to W. Bolyai on Sept. 2, 1808 This textbook adds a book devoted to applied mathematics to the series "Grundwissen Mathematik. " Our goals, like those of the other books in the series, are to explain connections and common viewpoints between various mathematical areas, to emphasize the motivation for studying certain prob lem areas, and to present the historical development of our subject. Our aim in this book is to discuss some of the central problems which arise in applications of mathematics, to develop constructive methods for the numerical solution of these problems, and to study the associated questions of accuracy. In doing so, we also present some theoretical results needed for our development, especially when they involve material which is beyond the scope of the usual beginning courses in calculus and linear algebra. This book is based on lectures given over many years at the Universities of Freiburg, Munich, Berlin and Augsburg.

An Introduction to Complex Function Theory Oct 12 2020 This book provides a rigorous yet elementary introduction to the theory of analytic functions of a single complex variable. While presupposing in its readership a degree of mathematical maturity, it insists on no formal prerequisites beyond a sound knowledge of calculus. Starting from basic definitions, the text slowly and carefully develops the ideas of complex analysis to the point where such landmarks of the subject as Cauchy's theorem, the Riemann mapping theorem, and the theorem of Mittag-Leffler can be treated without sidestepping any issues of rigor. The emphasis throughout is a geometric one, most pronounced in the extensive chapter dealing with conformal mapping, which amounts essentially to a "short course" in that important area of complex function theory. Each chapter concludes with a wide selection of exercises, ranging from straightforward computations to problems of a more conceptual and thought-provoking nature.

Differentialgeometrie, Topologie und Physik Mar 29 2022 Differentialgeometrie und Topologie sind wichtige Werkzeuge für die Theoretische Physik. Insbesondere finden sie Anwendung in den Gebieten der Astrophysik, der Teilchen- und Festkörperphysik. Das vorliegende beliebte Buch, das nun erstmals ins Deutsche übersetzt wurde, ist eine ideale Einführung für Masterstudenten und Forscher im Bereich der theoretischen und mathematischen Physik. - Im ersten Kapitel bietet das Buch einen Überblick über die Pfadintegralmethode und Eichtheorien. - Kapitel 2 beschäftigt sich mit den mathematischen Grundlagen von Abbildungen, Vektorräumen und der Topologie. - Die folgenden Kapitel beschäftigen sich mit fortgeschritteneren Konzepten der Geometrie und Topologie und diskutieren auch deren Anwendungen im Bereich der Flüssigkristalle, bei suprafluidem Helium, in der ART und der bosonischen Stringtheorie. - Daran anschließend findet eine Zusammenführung von Geometrie und Topologie statt: es geht um Faserbündel, characteristische Klassen und Indextheoreme (u.a. in Anwendung auf die supersymmetrische Quantenmechanik). - Die letzten beiden Kapitel widmen sich der spannendsten Anwendung von Geometrie und Topologie in der modernen Physik, nämlich den Eichfeldtheorien und der Analyse der Polakov'schen bosonischen Stringtheorie aus einer gemetrischen Perspektive. Mikio Nakahara studierte an der Universität Kyoto und am King's in London Physik sowie klassische und Quantengravitationstheorie. Heute ist er Physikprofessor an der Kinki-Universität in Osaka (Japan), wo er u. a. über topologische Quantencomputer forscht. Diese Buch entstand aus einer Vorlesung, die er während Forschungsaufenthalten an der University of Sussex und an der Helsinki University of Sussex gehalten hat.

An Illustrated Introduction to Topology and Homotopy Sep 03 2022 An Illustrated Introduction to Topology and Homotopy explores the beauty of topology and homotopy theory in a direct and engaging manner while illustrating the power of the theory through many, often surprising, applications. This self-contained book takes a visual and rigorous approach that incorporates both extensive illustrations and full proofs

Understanding Meaningful Environments Jun 27 2019 The real power for security applications will come from the synergy of academic and commercial research focusing on the specific issue of security. Special constraints apply to this domain, which are not always taken into consideration by academic research, but are critical for successful security applications: large volumes: techniques must be able to handle huge amounts of data and perform 'on-line' computation; scalability: algorithms must have processing times that scale well with ever growing volumes; automation: the analysis process must be automated so that information extraction can 'run on its own'; ease of use: everyday citizens should be able to extract and assess the necessary information; and robustness: systems must be able to cope with data of poor quality (missing or erroneous data). The NATO Advanced Study Institute (ASI) on Mining Massive Data Sets for Security, held in Italy, September 2007, brought together around ninety participants to discuss these issues. This publication includes the most important contributions, but can of course not entirely reflect the lively interactions which allowed the participants to exchange their views and share their experience. The bridge between academic methods and industrial constraints is systematically discussed throughout. This volume will thus serve as a reference book for anyone interested in understanding the techniques for handling very large data sets and how to apply them in conjunction for solving security issues.

Mathematics and Its History Apr 17 2021 A concise, unified view of mathematics together with its historical development. Aiming at mathematicians who have mastered the basic topics but wish to gain a better grasp of mathematics as a whole, the author gives the reasons for the emergence of the main fields of modern mathematics, and explains the connections between them by tracing the course of a few mathematical themes from ancient times down to the 20th century. The emphasis here is on history as a method for unifying and motivating mathematics, rather than as an end in itself, and there is more mathematical detail than in other general histories. However, no historical expertise is assumed, and classical mathematics is rephrased in modern terms where needed. Nevertheless, there are copious references to original sources for readers wishing to explore the classics for themselves. In summary, readers will be able to add to their mathematical knowledge as well as gaining a new perspective on what they already know.

Functions of Several Variables May 19 2021 This new edition, like the first, presents a thorough introduction to differential and integral calculus, including the integration of differential forms on manifolds. However, an additional chapter on elementary topology makes the book more complete as an advanced calculus text, and sections have been added introducing physical applications in thermodynamics, fluid dynamics, and classical rigid body mechanics.

Introduction to Optimal Control Theory Feb 02 2020 This monograph is an introduction to optimal control theory for systems governed by vector ordinary differential equations. It is not intended as a state-of-the-art handbook for researchers. We have tried to keep two types of reader in mind: (1) mathematicians, graduate students, and advanced undergraduates in mathematics who want a concise introduction to a field which contains nontrivial interesting applications of mathematics (for example, weak convergence, convexity, and the theory of ordinary differential equations); (2) economists, applied scientists, and engineers who want to understand some of the mathematical foundations. of optimal control theory. In general, we have emphasized motivation and explanation, avoiding the "definition-axiom-theorem-proof" approach. We make use of a large number of examples, especially one simple canonical example which we carry through the entire book. In proving theorems, we often just prove the simplest case, then state the more general results which can be proved. Many of the more difficult topics are discussed in the "Notes" sections at the end of chapters and several major proofs are in the Appendices. We feel that a solid understanding of basic facts is best attained by at first avoiding excessive generality. We have not tried to give an exhaustive list of references, preferring to refer the reader to existing books or papers with extensive bibliographies. References are given by author's name and the year of publication, e.g., Waltman [1974].

Basic Topology Aug 02 2022 In this broad introduction to topology, the author searches for topological invariants of spaces, together with techniques for their calculating. Students with knowledge of real analysis, elementary group theory, and linear algebra will quickly become familiar with a wide variety of techniques and applications involving point-set, geometric, and algebraic topology. Over 139 illustrations and more than 350 problems of various difficulties help students gain a thorough understanding of the subject.

An Introduction to Probabilistic Modeling Jul 29 2019 Introduction to the basic concepts of probability theory: independence, expectation, convergence in law and almost-sure convergence. Short expositions of more advanced topics such as Markov Chains, Stochastic Processes, Bayesian Decision Theory and Information Theory.
Topology of Surfaces Jul 01 2022 " . . . that famous pedagogical method whereby one begins with the general and proceeds to the particular only after the student is too confused to understand even that anymore. " Michael Spivak This text was written as an antidote to topology courses such as Spivak It is meant to provide the student with an experience in geomet describes. ric topology. Traditionally, the only topology an undergraduate might see is point-set topology at a fairly abstract level. The next course the average stu dent would take would be a graduate course in algebraic topology, and such courses are commonly very homological in nature, providing quick access to current research, but not developing any intuition or geometric sense. I have tried in this text to provide the undergraduate with a pragmatic introduction to the field, including a sampling from point-set, geometric, and algebraic topology, and trying not to include anything that the student cannot immediately experience. The exercises are to be considered as an in tegral part of the text and, ideally, should be addressed when they are met, rather than at the end of a block of material. Many of them are quite easy and are intended to give the student practice working with the definitions and digesting the current topic before proceeding. The appendix provides a brief survey of the group theory needed.
Topological and Uniform Spaces Dec 26 2021 This book is based on lectures I have given to undergraduate and graduate audiences at Oxford and elsewhere over the years. My aim has been to provide an outline of both the topological theory and the uniform theory, with an emphasis on the relation between the two. Although I hope that the prospec tive specialist may find it useful as an introduction it is the non-specialist I have had more in mind in selecting the contents. Thus I have tended to avoid the ingenious examples and counterexamples which often occupy much ofthe space in books on general topology, and I have tried to keep the number of definitions down to the essential minimum. There are no particular pre requisites but I have worked on the assumption that a potential reader will already have had some experience of working with sets and functions and will also be familiar with the basic concepts of algebra and analysis. There are a number of fine books on general topology, some of which I have listed in the Select Bibliography at the end of this volume. Of course I have benefited greatly from this previous work in writing my own account. Undoubtedly the strongest influence is that of Bourbaki's Topologie Generale [2], the definitive treatment of the subject which first appeared over a genera tion ago.
Inverse Limits Sep 22 2021 Inverse limits provide a powerful tool for constructing complicated spaces from simple ones. They also turn the study of a dynamical system consisting of a space and a self-map into a study of a (likely more complicated) space and a self-homeomorphism. In four chapters along with an appendix containing background material the authors develop the theory of inverse limits. The book begins with an introduction through inverse limits on [0,1] before moving to a general treatment of the subject. Special topics in continuum theory complete the book. Although it is not a book on dynamics, the influence of dynamics can be seen throughout; for instance, it includes studies of inverse limits with maps from families of maps that are of interest to dynamicists such as the logistic and the tent families. This book will serve as a useful reference to graduate students and researchers in continuum theory and dynamical systems. Researchers working in applied areas who are discovering inverse limits in their work will also benefit from this book.
Basic Concepts of Algebraic Topology Oct 04 2022 This text is intended as a one semester introduction to algebraic topology at the undergraduate and beginning graduate levels. Basically, it covers simplicial homology theory, the fundamental group, covering spaces, the higher homotopy groups and introductory singular homology theory. The text follows a broad historical outline and uses the proofs of the discoverers of the important theorems when this is consistent with the elementary level of the course. This method of presentation is intended to reduce the abstract nature of algebraic topology to a level that is palatable for the beginning student and to provide motivation and cohesion that are often lacking in abstact treatments. The text emphasizes the geometric approach to algebraic topology and attempts to show the importance of topological concepts by applying them to problems of geometry and analysis. The prerequisites for this course are calculus at the sophomore level, a one semester introduction to the theory of groups, a one semester introduc tion to point-set topology and some familiarity with vector spaces. Outlines of the prerequisite material can be found in the appendices at the end of the text. It is suggested that the reader not spend time initially working on the appendices, but rather that he read from the beginning of the text, referring to the appendices as his memory needs refreshing. The text is designed for use by college juniors of normal intelligence and does not require "mathematical maturity" beyond the junior level.
The Heritage of Thales Sep 30 2019 The authors' novel approach to some interesting mathematical concepts - not normally taught in other courses - places them in a historical and philosophical setting. Although primarily intended for mathematics undergraduates, the book will also appeal to students in the sciences, humanities and education with a strong interest in this subject. The first part proceeds from about 1800 BC to 1800 AD, discussing, for example, the Renaissance method for solving cubic and quartic equations and providing rigorous elementary proof that certain geometrical problems posed by the ancient Greeks cannot be solved by ruler and compass alone. The second part presents some fundamental topics of interest from the past two centuries, including proof of G del's incompleteness theorem, together with a discussion of its implications.
Linear Algebra Through Geometry Dec 14 2020 This book introduces the concepts of linear algebra through the careful study of two and three-dimensional Euclidean geometry. This approach makes it possible to start with vectors, linear transformations, and matrices in the context of familiar plane geometry and to move directly to topics such as dot products, determinants, eigenvalues, and quadratic forms. The later chapters deal with n-dimensional Euclidean space and other finite-dimensional vector space.
Geometry, Topology and Physics Feb 13 2021 Differential geometry and topology have become essential tools for many theoretical physicists. In particular, they are indispensable in theoretical studies of condensed matter physics, gravity, and particle physics. Geometry, Topology and Physics, Second Edition introduces the ideas and techniques of differential geometry and topology at a level suitable for postgraduate students and researchers in these fields. The second edition of this popular and established text incorporates a number of changes designed to meet the needs of the reader and reflect the development of the subject. The book features a considerably expanded first chapter, reviewing aspects of path integral quantization and gauge theories. Chapter 2 introduces the mathematical concepts of maps, vector spaces, and topology. The following chapters focus on more elaborate concepts in geometry and topology and discuss the application of these concepts to liquid crystals, superfluid helium, general relativity, and bosonic string theory. Later chapters unify geometry and topology, exploring fiber bundles, characteristic classes, and index theorems. New to this second edition is the proof of the index theorem in terms of supersymmetric quantum mechanics. The final two chapters are devoted to the most fascinating applications of geometry and topology in contemporary physics, namely the study of anomalies in gauge field theories and the analysis of Polakov's bosonic string theory from the geometrical point of view. Geometry, Topology and Physics, Second Edition is an ideal introduction to differential geometry and topology for postgraduate students and researchers in theoretical and mathematical physics.
Topics in Physical Mathematics Oct 31 2019 As many readers will know, the 20th century was a time when the fields of mathematics and the sciences were seen as two separate entities. Caused by the rapid growth of the physical sciences and an increasing abstraction in mathematical research, each party, physicists and mathematicians alike, suffered a misconception; not only of the opposition’s theoretical underpinning, but of how the two subjects could be intertwined and effectively utilized. One sub-discipline that played a part in the union of the two subjects is Theoretical Physics. Breaking it down further came the fundamental theories, Relativity and Quantum theory, and later on Yang-Mills theory. Other areas to emerge in this area are those derived from the works of Donaldson, Chern-Simons, Floer-Fukaya, and Seiberg-Witten. Aimed at a wide audience, Physical Topics in Mathematics demonstrates how various physical theories have played a crucial role in the developments of Mathematics and in particular, Geometric Topology. Issues are studied in great detail, and the book steadfastly covers the background of both Mathematics and Theoretical Physics in an effort to bring the reader to a deeper understanding of their interaction. Whilst the world of Theoretical Physics and Mathematics is boundless; it is not the intention of this book to cover its enormity. Instead, it seeks to lead the reader through the world of Physical Mathematics; leaving them with a choice of which realm they wish to visit next.
Differential Forms in Algebraic Topology Jan 03 2020 Developed from a first-year graduate course in algebraic topology, this text is an informal introduction to some of the main ideas of contemporary homotopy and cohomology theory. The materials are structured around four core areas: de Rham theory, the Cech-de Rham complex, spectral sequences, and characteristic classes. By using the de Rham theory of differential forms as a prototype of cohomology, the machineries of algebraic topology are made easier to assimilate. With its stress on concreteness, motivation, and readability, this book is equally suitable for self-study and as a one-semester course in topology.
Second Year Calculus Jun 07 2020 Second Year Calculus: From Celestial Mechanics to Special Relativity covers multi-variable and vector calculus, emphasizing the historical physical problems which gave rise to the concepts of calculus. The book guides us from the birth of the mechanized view of the world in Isaac Newton's Mathematical Principles of Natural Philosophy in which mathematics becomes the ultimate tool for modelling physical reality, to the dawn of a radically new and often counter-intuitive age in Albert Einstein's Special Theory of Relativity in which it is the mathematical model which suggests new aspects of that reality. The development of this process is discussed from the modern viewpoint of differential forms. Using this concept, the student learns to compute orbits and rocket trajectories, model flows and force fields, and derive the laws of electricity and magnetism. These exercises and observations of mathematical symmetry enable the student to better understand the interaction of physics and mathematics.
Introduction to Calculus and Classical Analysis Dec 02 2019 As an excellent, easy-to-understand introduction to analysis, this book involves rigorous analysis, computational dexterity, and a breadth of applications, making it ideal for undergraduate majors. The book contains many remarkable features, including a heavy emphasis on computational problems and applications from many parts of analysis. The work completely avoids treating complex numbers. Nearly 350 problems with solutions are included in the back of the book.
Deutsche Bibliographie Jun 19 2021
Variational Calculus and Optimal Control Sep 10 2020 An introduction to the variational methods used to formulate and solve mathematical and physical problems, allowing the reader an insight into the systematic use of elementary (partial) convexity of differentiable functions in Euclidian space. By helping students directly characterize the solutions for many minimization problems, the text serves as a prelude to the field theory for sufficiency, laying as it does the groundwork for further explorations in mathematics, physics, mechanical and electrical engineering, as well as computer science.
Basic Concepts of Algebraic Topology Oct 24 2021 The text traces the development of algebraic topology form its inception in 1895 through the development of singular

homology theory. Primary topics include geometric complexes, simplicial homology groups, simplicial mappings, the fundamental group, covering spaces, and introductory singular homology theory, as well as the higher homotopy groups and the homology sequence--two areas seldom covered in introductory text. The author develops many important applications, including the fixed point theorems of Brouwer and Lefschetz, vector fields on spheres, and the covering homotopy property.

Lie-Gruppen und Lie-Algebren in der Physik Aug 22 2021 Lie-Gruppen sind ein unverzichtbares Werkzeug in der Quantenmechanik, der Quantenchromodynamik und für Eichtheorien. Die algebraische Struktur dieser mathematischen Gruppen bildet in der Physik die Grundlage, um die Eigenschaften von Symmetrien zu beschreiben. Das einzige deutschsprachige Lehrbuch zum Thema liefert neben grundlegenden Kapiteln über Gruppen und algebraische Darstellung eine detaillierte Einführung zu Lie-Gruppen und Lie-Algebren. Anschließend können Leser den Stoff anhand der Berechnung weiterführender Lie-Algebren vertiefen.

Applied Linear Algebra and Matrix Analysis Mar 17 2021 This new book offers a fresh approach to matrix and linear algebra by providing a balanced blend of applications, theory, and computation, while highlighting their interdependence. Intended for a one-semester course, Applied Linear Algebra and Matrix Analysis places special emphasis on linear algebra as an experimental science, with numerous examples, computer exercises, and projects. While the flavor is heavily computational and experimental, the text is independent of specific hardware or software platforms. Throughout the book, significant motivating examples are woven into the text, and each section ends with a set of exercises.

An Introduction to Difference Equations May 07 2020 This book grew out of lecture notes I used in a course on difference equations that I taught at Trinity University for the past five years. The classes were largely pop ulated by juniors and seniors majoring in Mathematics, Engineering, Chemistry, Computer Science, and Physics. This book is intended to be used as a textbook for a course on difference equations at the level of both advanced undergraduate and beginning graduate. It may also be used as a supplement for engineering courses on discrete systems and control theory. The main prerequisites for most of the material in this book are calculus and linear algebra. However, some topics in later chapters may require some rudiments of advanced calculus. Since many of the chapters in the book are independent, the instructor has great flexibility in choosing topics for the first one-semester course. A diagram showing the interdependence of the chapters in the book appears following the preface. This book presents the current state of affairs in many areas such as stability, Z-transform, asymptoticity, oscillations and control theory. However, this book is by no means encyclopedic and does not contain many important topics, such as Numerical Analysis, Combinatorics, Special functions and orthogonal polyno mials, boundary value problems, partial difference equations, chaos theory, and fractals. The nonselection of these topics is dictated not only by the limitations imposed by the elementary nature of this book, but also by the research interest (or lack thereof) of the author.

Measure, Topology, and Fractal Geometry May 31 2022 Based on a course given to talented high-school students at Ohio University in 1988, this book is essentially an advanced undergraduate textbook about the mathematics of fractal geometry. It nicely bridges the gap between traditional books on topology/analysis and more specialized treatises on fractal geometry. The book treats such topics as metric spaces, measure theory, dimension theory, and even some algebraic topology. It takes into account developments in the subject matter since 1990. Sections are clear and focused. The book contains plenty of examples, exercises, and good illustrations of fractals, including 16 color plates.

Principles of Topology Nov 05 2022 Originally published: Philadelphia: Saunders College Publishing, 1989; slightly corrected.

Elementary Topics in Differential Geometry Jul 09 2020 In the past decade there has been a significant change in the freshman/ sophomore mathematics curriculum as taught at many, if not most, of our colleges. This has been brought about by the introduction of linear algebra into the curriculum at the sophomore level. The advantages of using linear algebra both in the teaching of differential equations and in the teaching of multivariate calculus are by now widely recognized. Several textbooks adopting this point of view are now available and have been widely adopted. Students completing the sophomore year now have a fair preliminary under standing of spaces of many dimensions. It should be apparent that courses on the junior level should draw upon and reinforce the concepts and skills learned during the previous year. Unfortunately, in differential geometry at least, this is usually not the case. Textbooks directed to students at this level generally restrict attention to 2-dimensional surfaces in 3-space rather than to surfaces of arbitrary dimension. Although most of the recent books do use linear algebra, it is only the algebra of ~3. The student's preliminary understanding of higher dimensions is not cultivated.

Mathematical Reflections Nov 12 2020 A relaxed and informal presentation conveying the joy of mathematical discovery and insight. Frequent questions lead readers to see mathematics as an accessible world of thought, where understanding can turn opaque formulae into beautiful and meaningful ideas. The text presents eight topics that illustrate the unity of mathematical thought as well as the diversity of mathematical ideas. Drawn from both "pure" and "applied" mathematics, they include: spirals in nature and in mathematics; the modern topic of fractals and the ancient topic of Fibonacci numbers; Pascals Triangle and paper folding; modular arithmetic and the arithmetic of the infinite. The final chapter presents some ideas about how mathematics should be done, and hence, how it should be taught. Presenting many recent discoveries that lead to interesting open questions, the book can serve as the main text in courses dealing with contemporary mathematical topics or as enrichment for other courses. It can also be read with pleasure by anyone interested in the intellectually intriguing aspects of mathematics.

Who's who in Technology Today Nov 24 2021

Discrete Probability Apr 05 2020 Intended as a first course in probability at post-calculus level, this book is of special interest to students majoring in computer science as well as in mathematics. Since calculus is used only occasionally in the text, students who have forgotten their calculus can nevertheless easily understand the book, and its slow, gentle style and clear exposition will also appeal. Basic concepts such as counting, independence, conditional probability, random variables, approximation of probabilities, generating functions, random walks and Markov chains are all clearly explained and backed by many worked exercises. The 1,196 numerical answers to the 405 exercises, many with multiple parts, are included at the end of the book, and throughout, there are various historical comments on the study of probability. These include biographical information on such famous contributors as Fermat, Pascal, the Bernoullis, DeMoivre, Bayes, Laplace, Poisson, and Markov. Of interest to a wide range of readers and useful in many undergraduate programs.

Foundations of Topology Jan 15 2021 Topology is a branch of pure mathematics that deals with the abstract relationships found in geometry and analysis. Written with the mature student in mind, Foundations of Topology, Second Edition, provides a user-friendly, clear, and concise introduction to this fascinating area of mathematics. The author introduces topics that are well motivated with thorough proofs that make them easy to follow. Historical comments are dispersed throughout the text, and exercises, varying in degree of difficulty, are found at the end of each chapter. Foundations of Topology is an excellent text for teaching students how to develop the skill to write clear and precise proofs.

Rings, Fields, and Vector Spaces Mar 05 2020 Using the proof of the non-trisectability of an arbitrary angle as a final goal, the author develops in an easy conversational style the basics of rings, fields, and vector spaces. Originally developed as a text for an introduction to algebra course for future high-school teachers at California State University, Northridge, the focus of this book is on exposition. It would serve extremely well as a focused, one-semester introduction to abstract algebra.

A First Course in Geometric Topology and Differential Geometry Feb 25 2022 The uniqueness of this text in combining geometric topology and differential geometry lies in its unifying thread: the notion of a surface. With numerous illustrations, exercises and examples, the student comes to understand the relationship of the modern abstract approach to geometric intuition. The text is kept at a concrete level, avoiding unnecessary abstractions, yet never sacrificing mathematical rigor. The book includes topics not usually found in a single book at this level.

I-Density Continuous Functions Jul 21 2021 The classical approach to showing the parallel between theorems concerning Lebesgue measure and theorems concerning Baire category on the real line is restricted to sets of measure zero and sets of first category. This is because classical Baire category theory does not have an analogue for the Lebesgue density theorem. By using {mathcal I}-density, this deficiency is removed, and much of the structure of measurable sets and functions can be shown to exist in the sense of category as well. This monograph explores category analogues to such things as the density topology, approximate continuity, and density continuity. In addition, some questions about topological semigroups of real functions are answered.

Basic Algebraic Topology and its Applications Apr 29 2022 This book provides an accessible introduction to algebraic topology, a field at the intersection of topology, geometry and algebra, together with its applications. Moreover, it covers several related topics that are in fact important in the overall scheme of algebraic topology. Comprising eighteen chapters and two appendices, the book integrates various concepts of algebraic topology, supported by examples, exercises, applications and historical notes. Primarily intended as a textbook, the book offers a valuable resource for undergraduate, postgraduate and advanced mathematics students alike. Focusing more on the geometric than on algebraic aspects of the subject, as well as its natural development, the book conveys the basic language of modern algebraic topology by exploring homotopy, homology and cohomology theories, and examines a variety of spaces: spheres, projective spaces, classical groups and their quotient spaces, function spaces, polyhedra, topological groups, Lie groups and cell complexes, etc. The book studies a variety of maps, which are continuous functions between spaces. It also reveals the importance of algebraic topology in contemporary mathematics, theoretical physics, computer science, chemistry, economics, and the biological and medical sciences, and encourages students to engage in further study.

Ideals, Varieties, and Algorithms Aug 10 2020 Written at a level appropriate to undergraduates, this book covers such topics as the Hilbert Basis Theorem, the Nullstellensatz, invariant theory, projective geometry, and dimension theory. The book bases its discussion of algorithms on a generalisation of the division algorithm for polynomials in one variable that was only discovered in the 1960's. Although the algorithmic roots of algebraic geometry are old, the computational aspects were neglected earlier in this century. This has changed in recent years, and new algorithms, coupled with the power of fast computers, have let to some interesting applications, for example in robotics and in geometric theorem proving. In preparing this new edition, the authors present an improved proof of the Buchberger Criterion as well as a proof of Bezout's Theorem.