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QPQSFI - ELIEZER MARIANA

The series is devoted to the publication of monographs and high-level textbooks in mathematics, mathematical methods and their applications. Apart from covering important areas of current interest, a major aim is to make topics of an interdisciplinary nature accessible to the non-specialist. The works in this series are addressed to advanced students and researchers in mathematics and theoretical physics. In addition, it can serve as a guide for lectures and seminars on a graduate level. The series de Gruyter Studies in Mathematics was founded ca. 30 years ago by the late Professor Heinz Bauer and Professor Peter Gabriel with the aim to establish a series of monographs and textbooks of high standard, written by scholars with an international reputation presenting current fields of research in pure and applied mathematics. While the editorial board of the Studies has changed with the years, the aspirations of the Studies are unchanged. In times of rapid growth of mathematical knowledge carefully written monographs and textbooks written by experts are needed more than ever, not least to pave the way for the next generation of mathematicians. In this sense the editorial board and the publisher of the Studies are devoted to continue the Studies as a service to the mathematical community. Please submit any book proposals to Niels Jacob.

Essentials of geometry -- Reasoning and proof -- Parallel and perpendicular lines -- Congruent triangles -- Relationships within triangles -- Similarity -- Right triangles and trigonometry -- Quadrilaterals -- Properties of transformations -- Properties of circles -- Measuring length and area -- Surface area and volume of solids.

This book is a text for junior, senior, or first-year graduate courses traditionally titled Foundations of Geometry and/or Non Euclidean Geometry. The first 29 chapters are for a semester or year course on the foundations of geometry. The remaining chap ters may then be used for either a regular course or independent study courses. Another possibility, which is also especially suited for in-service teachers of high school geometry, is to survey the the fundamentals of absolute geometry (Chapters 1 -20) very quickly and begin earnest study with the theory of parallels and isometries (Chapters 21 -30). The text is self-contained, except that the elementary calculus is assumed for some parts of the material on advanced hyperbolic geometry (Chapters 31 -34). There are over 650 exercises, 30 of which are 10-part true-or-false questions. A rigorous ruler-and-protractor axiomatic development of the Euclidean and hyperbolic planes, including the classification of the isometries of these planes, is balanced by the discussion about this development. Models, such as Taxicab Geometry, are used exten sively to illustrate theory. Historical aspects and alternatives to the selected axioms are prominent. The classical axiom systems of Euclid and Hilbert are discussed, as are axiom systems for three and four-dimensional absolute geometry and Pieri's system based on rigid motions. The text is divided into three parts. The Introduction (Chapters 1 -4) is to be read as quickly as possible and then used for ref erence if necessary.

The first book of its kind, New Foundations in Mathematics: The Geometric Concept of Number uses geometric algebra to present an innovative approach to elementary and advanced mathematics. Geometric algebra offers a simple and robust means of expressing a wide range of ideas in mathematics, physics, and engineering. In particular, geometric algebra extends the real number system to include the concept of direction, which underpins much of modern mathematics and physics. Much of the material presented has been developed from undergraduate courses taught by the author over the years in linear algebra, theory of numbers, advanced calculus and vector calculus, numerical analysis, modern abstract algebra, and differential geometry. The principal aim of this book is to present these ideas in a freshly coherent and accessible manner. New Foundations in Mathematics will be of interest to undergraduate and graduate students of mathematics and physics who are looking for a unified treatment of many important geometric ideas arising in these subjects at all levels. The material can also serve as a supplemental textbook in some or all of the areas mentioned above and as a reference book for professionals who apply mathematics to engineering and computational areas of mathematics and physics.

Additive and Polynomial Representations deals with major representation theorems in which the qualitative structure is reflected as some polynomial function of one or more numerical functions defined on the basic entities. Examples are additive expressions of a single measure (such as the probability of disjoint events being the sum of their probabilities), and additive expressions of two measures (such as the logarithm of momentum being the sum of log mass and log velocity terms). The book describes the three basic procedures of fundamental measurement as the mathematical pivot, as the utilization of constructive methods, and as a series of isomorphism theorems leading to consistent numerical solutions. The text also explains the counting of units in relation to an empirical relational structure which contains a concatenation operation. The book notes some special variants which arise in connection with relativity and thermodynamics. The text cites examples from physics and psychology for which additive conjoint measurement provides a possible method of fundamental measurement. The book will greatly benefit mathematicians, econometricians, and academicians in advanced mathematics or physics.

The Volume Examines, In Depth, The Implications Of Indian History And Philosophy For Contemporary Mathematics And Science. The Conclusions Challenge Current Formal Mathematics And Its Basis In The Western Dogma That Deduction Is Infallible (Or That It Is Less Fallible Than Induction). The Development Of The Calculus In India, Over A Thousand Years, Is Exhaustively Documented In This Volume, Along With Novel Insights, And Is Related To The Key Sources Of Wealth-Monsoon-Dependent Agriculture And Navigation Required For Overseas Trade - And The Corresponding Requirement Of Timekeeping. Refecting The Usual Double Standard Of Evidence Used To Construct Eurocentric History, A Single, New Standard Of Evidence For Transmissions Is Proposed. Using This, It Is Pointed Out That Jesuits In Cochin, Following The Toledo Model Of Translation, Had Long-Term Opportunity To Transmit Indian Calculus Texts To Europe. The European Navigational Problem Of Determining Latitude, Longitude, And Loxodromes, And The 1582 Gregorian Calendar-Reform, Provided Ample Motivation. The Mathematics In These Earlier Indian Texts Suddenly Starts Appearing In European Works From The Mid-16Th Century Onwards, Providing Compelling Circumstantial Evidence. While The Calculus In India Had Valid Pramana, This Differed From Western Notions Of Proof, And The Indian (Algorismus) Notion Of Number Differed From The European (Abacus) Notion. Hence, Like Their Earlier Difficulties With The Algorismus, Europeans Had Difficulties In Understanding The Calculus, Which, Like Computer Technology, Enhanced The Ability To Calculate, Albeit In A Way Regarded As Epistemologically Insecure. Present-Day Difficulties In Learning Mathematics Are Related, Via Phylogeny Is Ontogeny , To These Historical Difficulties In Assimilating Imported Mathematics. An Appendix Takes Up Further Contemporary Implications Of The New Philosophy Of Mathematics For The Extension Of The Calculus, Which Is Needed To Handle The Infinities Arising In The Study Of Shock Waves And The Renormalization Problem Of Quantum Field Theory.

From 1895, the year he published his first signed article, to four days before his death in 1970 when he wrote his last, Bertrand Russell was a powerful force in the world of mathematics, philosophy, human rights and the struggle for peace. During those years he published 70 books, almost as many pamphlets and over 2,000 articles, he also contributed pieces to some 200 books. The availability of the Bertrand Russell Archives at McMaster University since 1968 has made it possible for the first time to compile a full, descriptive bibliography of his writings. The Collected Papers are based on it. Fully annotated, the Bibliography is textually oriented and will guide the scholar, collector and general reader to the authoritative editions of Russell's works. It includes references to the locations of all known speeches and interviews, and reproductions of the dust-jackets of Russell's books. Blackwell, Ruja and Turcon have cooperated for nearly 20 years on the new Bibliography. Lord Russell saw the extensive additions for it near the end of his life and declared: `I am impressed.'

Over the past 15 years, there has been a growing need in the medical image computing community for principled methods to process nonlinear geometric data. Riemannian geometry has emerged as one of the most powerful mathematical and computational frameworks for analyzing such data. Riemannian Geometric Statistics in Medical Image Analysis is a complete reference on statistics on Riemannian manifolds and more general nonlinear spaces with applications in medical image analysis. It provides an introduction to the core methodology followed by a presentation of state-of-the-art methods. Beyond medical image computing, the methods described in this book may also apply to other domains such as signal processing, computer vision, geometric deep learning, and other domains where statistics on geometric features appear. As such, the presented core methodology takes its place in the field of geometric statistics, the statistical analysis of data being elements of nonlinear geometric spaces. The foundational material and the advanced techniques presented in the later parts of the book can be useful in domains outside medical imaging and present important applications of geometric statistics methodology Content includes: The foundations of Riemannian geometric methods for statistics on manifolds with emphasis on concepts rather than on proofs Applications of statistics on manifolds and shape spaces in medical image computing Diffeomorphic deformations and their applications As the methods described apply to domains such as signal processing (radar signal processing and brain computer interaction), computer vision (object and face recognition), and other domains where statistics of geometric features appear, this book is suitable for researchers and graduate students in medical imaging, engineering and computer science. A complete reference covering both the foundations and state-of-the-art methods Edited and authored by leading researchers in the field Contains theory, examples, applications, and algorithms Gives an overview of current research challenges and future applications

Foundations of Geometry, Second Edition is written to help enrich the education of all mathematics majors and facilitate a smooth transition into more advanced mathematics courses. The text also implements the latest national standards and recommendations regarding geometry for the preparation of high school mathematics teachers--and encourages students to make connections between their college courses and classes they will later teach. This text's coverage begins with Euclid's Elements, lays out a system of axioms for geometry, and then moves on to neutral geometry, Euclidian and hyperbolic geometries from an axiomatic point of view, and then non-Euclidean geometry. Good proof-writing skills are emphasized, along with a historical development of geometry. The Second Edition streamlines and reorganizes material in order to reach coverage of neutral geometry as early as possible, adds more exercises throughout, and facilitates use of the open-source software Geogebra. This text is ideal for an undergraduate course in axiomatic geometry for future high school geometry teachers, or for any student who has not yet encountered upper-level math, such as real analysis or abstract algebra. It assumes calculus and linear algebra as prerequisites.

In his work on rings of operators in Hilbert space, John von Neumann discovered a new mathematical structure that resembled the lattice system Ln. In characterizing its properties, von Newmann founded the field of continuous geometry. For students and researchers interested in ring theory or projective geometries, von Neumann discusses his findings and their applications.

How do buildings store information and experience in their shape and form? Michael Leyton has attracted considerable attention with his interpretation of geometrical form as a medium for the storage of information and memory. In this publication he draws specific conclusions for the field of architecture and construction, attaching fundamental importance to the complex relationship between symmetry and asymmetry. Wie können Gebäudeformen Erfahrungen und Inhalte speichern? Leyton hat eine viel beachtete neue Theorie der geometrischen Form entwickelt. Er interpretiert die geometrische Form – im Gegensatz zur gesamten Tradition – als Informations- und Gedächtnisträger. In vorliegender Darstellung zieht er die spezifischen Konsequenzen davon für den Bereich der Architektur und des Bauens.

The English edition differs only slightly from the Russian original. The main struc tural difference is that all the material on the theory of finite noncooperative games has been collected in Chapter 2, with renumbering of the material of the remain ing chapters. New sections have been added in this chapter: devoted to general questions of equilibrium theory in nondegenerate games, subsections 3.9-3.17, by N.N. Vorob'ev, Jr.; and § 4, by A.G. Chernyakov; and § 5, by N.N. Vorob'ev, Jr., on the computational complexity of the process of finding equilibrium points in finite games. It should also be mentioned that subsections 3.12-3.14 in Chapter 1 were written by E.B. Yanovskaya especially for the Russian edition. The author regrets that the present edition does not reflect the important game-theoretical achievements presented in the splendid monographs by E. van Damme (on the refinement of equilibrium principles for finite games), as well as those by J.e. Harsanyi and R. Selten, and by W. Giith and B. Kalkofen (on equilibrium selection). When the Russian edition was being written, these direc tions in game theory had not yet attained their final form, which appeared only in quite recent monographs; the present author has had to resist the temptation of attempting to produce an elementary exposition of the new theories for the English edition; readers of this edition will find only brief mention of the new material.

The outcome of a close collaboration between mathematicians and mathematical physicists, these lecture notes present the foundations of A. Connes noncommutative geometry as well as its applications in particular to the field of theoretical particle physics. The coherent and systematic approach makes this book useful for experienced researchers and postgraduate students alike.

This volume provides a modern introduction to stochastic geometry, random fields and spatial statistics at a (post)graduate level. It is focused on asymptotic methods in geometric probability including weak and strong limit theorems for random spatial structures (point processes, sets, graphs, fields) with applications to statistics. Written as a contributed volume of lecture notes, it will be useful not only for students but also for lecturers and researchers interested in geometric probability and related subjects.

This book provides an introduction to abstract algebraic geometry. It includes more than 400 exercises that offer specific examples as well as more specialized topics. From the reviews: "Enables the reader to make the drastic transition between the basic, intuitive questions about affine and projective varieties with which the subject begins, and the elaborate general methodology of schemes and cohomology employed currently to answer these questions." --MATHEMATICAL REVIEWS

This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Engineers and researchers concerned with the problems of thin-walled structures have a choice of books on shell theory. However, the almost exclusive concern of these books are shells designed for maximum strength and stiffness. Shells which are designed for maximum elastic displacements (flexible shells) have been used in industry for decades, but are largely ignored in shell-theory books due to tradition and to the wide variety of shapes and problems involved. This book presents the general theory of elastic shells and the deformation inherent in flexibility. For the analysis of stability of the two-dimensionally variable large elastic deformations, a local approach is developed. The specialized theory is then applied to the basic problems of flexible shells - tubes, open-section beams and shells of revolution. The results of parametric studies are presented in numerous graphs.

Explains geometric theories and shows many examples.

(revised) This is a textbook on classical mechanics at the intermediate level, but its main purpose is to serve as an introduction to a new mathematical language for physics called geometric algebra. Mechanics is most commonly formulated today in terms of the vector algebra developed by the American physicist J. Willard Gibbs, but for some applications of mechanics the algebra of complex numbers is more efficient than vector algebra, while in other applications matrix algebra works better. Geometric algebra integrates all these algebraic systems into a coherent mathematical language which not only retains the advantages of each special algebra but possesses powerful new capabilities. This book covers the fairly standard material for a course on the mechanics of particles and rigid bodies. However, it will be seen that geometric algebra brings new insights into the treatment of nearly every topic and produces simplifications that move the subject quickly to advanced levels. That has made it possible in this book to carry the treatment of two major topics in mechanics well beyond the level of other textbooks. A few words are in order about the unique treatment of these two topics, namely, rotational dynamics and celestial mechanics.

Does your classroom run the way you want? Most people enter the teaching profession wanting to make a difference in young people's lives. However, more and more teachers feel lost, frustrated, and overwhelmed with everything they're required to do. It's hard to be successful without a clear plan on getting control of your classroom, empowering your students, and making the learning experience more enjoyable for you and your students. These 18 chapters are crucial for any educator who wants to take their teaching to the next level. Teacher, Principal, Director, Dean, and YouTube/TikTok teacher, Tyler Tarver knows that education is more than just standing in front of students lecturing them on a specific topic - it's a culture of learning that educators foster to train the next generation. If you are attempting to be the best educator you can in the environment you're in, you need ideas and encouragement from someone who's been exactly where you are. Even if you had the time, money, and support we know teachers deserve, we know that applying any knowledge always has a greater impact when you're able to give personal and practical application to the ideas you know matter. Besides sitting through 60+ hours a year of professional development, there is another way to incrementally improve your teaching week after week. Spoiler Alert: It can also be fun. Tyler Tarver learned how to create the culture he wanted in his classroom. He was able to pass this on to any educator who wanted to get excited about teaching and have a deeper impact on their students. He wrote The Baller Teacher Playbook to teach others what it takes to expand your teaching and create a community of happy and engaged learners. These short, weekly chapters and accompanying resources will add enormous value to your classroom and the school you work for. In this 18-week guide, readers will be introduced to the top areas where truly successful teachers and their students excel: Reason vs Excuses: How do you overcome the hurdles inherent in education? Fun: How do you get yourself and students excited about learning? Creativity: How do you create a culture where every day is unexpected but not chaotic? Positivity: How can we roll with the punches but not have to fake it? Authenticity: How can I be myself but genuinely connect with young people? Leadership: How do I get my students to lead without me? Collaboration: How do I work with my administrators, colleagues, and parents to better every student's education? Diversity: How do I help build empathy and understanding among myself and my students? Development: How am I always getting better? Plus more! The Baller Teacher Playbook is the must-have guide for anyone who feels lost or overwhelmed by the current educational climate, even if they have been teaching for years. Learn from a fellow educator who had their fair share of mistakes and successes through the simple but effective tactics shared in these pages. Take things further: If you want to move forward even faster as an educational professional, read a chapter once a week with your team, and come together at weekly meetings to discuss experience, ideas, triumphs, and a community of educators trying to improve themselves and their classroom.

Cosmology has been transformed by dramatic progress in high--precision observations and theoretical modelling. This book surveys key developments and open issues for graduate students and researchers. Using a relativistic geometric approach, it focuses on the general concepts and relations that underpin the standard model of the Universe. Part I covers foundations of relativistic cosmology whilst Part II develops the dynamical and observational relations for all models of the Universe based on general relativity. Part III focuses on the standard model of cosmology, including inflation, dark matter, dark energy, perturbation theory, the cosmic microwave background, structure formation and gravitational lensing. It also examines modified gravity and inhomogeneity as possible alternatives to dark energy. Anisotropic and inhomogeneous models are described in Part IV, and Part V reviews deeper issues, such as quantum cosmology, the start of the universe and the multiverse proposal. Colour versions of some figures are available at www.cambridge.org/9780521381154.

This is a textbook on classical mechanics at the intermediate level, but its main purpose is to serve as an introduction to a new mathematical language for physics called geometric algebra. Mechanics is most commonly formulated today in terms of the vector algebra developed by the American physicist J. Willard Gibbs, but for some applications of mechanics the algebra of complex numbers is more efficient than vector algebra, while in other applica tions matrix algebra works better. Geometric algebra integrates all these algebraic systems into a coherent mathematical language which not only retains the advantages of each special algebra but possesses powerful new capabilities. This book covers the fairly standard material for a course on the mechanics of particles and rigid bodies. However, it will be seen that geometric algebra brings new insights into the treatment of nearly every topic and produces simplifications that move the subject quickly to advanced levels. That has made it possible in this book to carry the treatment of two major topics in mechanics well beyond the level of other textbooks. A few words are in order about the unique treatment of these two topics, namely, rotational dynamics and celestial mechanics.

Quantum mechanics, its properties including wavefunctions, complex numbers and uncertainty, are necessary and completely reasonable and understandable, with no weirdness. Classical physics is impossible. Much uncertainty comes from Fourier analysis. Waves and particles and collapse of wavefunctions are meaningless. Their seeming appearance in analyzed. Reasons and limitations of superposition are considered. Gravitation is an example of nonlinearity. All objects interact so nonlinearity is universal. How quantum mechanics then fits in is shown. Dirac's equation comes from Poincaré group. Physics is necessarily impossible in any space but that with dimension 3+1. Spin-statistics is a property of rotation groups.

The cognitive foundations of geometry have puzzled academics for a long time, and even today are mostly unknown to many scholars, including mathematical cognition researchers. Foundations of Geometric Cognition shows that basic geometric skills are deeply hardwired in the visuospatial cognitive capacities of our brains, namely spatial navigation and object recognition. These capacities, shared with non-human animals and appearing in early stages of the human ontogeny, cannot, however, fully explain a uniquely human form of geometric cognition. In the book, Hohol argues that Euclidean geometry would not be possible without the human capacity to create and use abstract concepts, demonstrating how language and diagrams provide cognitive scaffolding for abstract geometric thinking, within a context of a Euclidean system of thought. Taking an interdisciplinary approach and drawing on research from diverse fields including psychology, cognitive science, and mathematics, this book is a must-read for cognitive psychologists and cognitive scientists of mathematics, alongside anyone interested in mathematical education or the philosophical and historical aspects of geometry.

"This text is for a one-semester undergraduate course on geometry. It is richly illustrated and contains hundreds of exercises."---BOOK JACKET.

Essentials of integral geometry in a homogenous space are presented and the focus is on the basic results and applications. This book provides the readers with new findings, some being published for the first time and serves as an excellent graduate text. Request Inspection Copy

In this first modern, critical assessment of the place of mathematics in Berkeley's philosophy and Berkeley's place in the history of mathematics, Douglas M. Jesseph provides a bold reinterpretation of Berkeley's work. Jesseph challenges the prevailing view that Berkeley's mathematical writings are peripheral to his philosophy and argues that mathematics is in fact central to his thought, developing out of his critique of abstraction. Jesseph's argument situates Berkeley's ideas within the larger historical and intellectual context of the Scientific Revolution. Jesseph begins with Berkeley's radical opposition to the received view of mathematics in the philosophy of the late seventeenth and early eighteenth centuries, when mathematics was considered a "science of abstractions." Since this view seriously conflicted with Berkeley's critique of abstract ideas, Jesseph contends that he was forced to come up with a nonabstract philosophy of mathematics. Jesseph examines Berkeley's unique treatments of geometry and arithmetic and his famous critique of the calculus in The Analyst. By putting Berkeley's mathematical writings in the perspective of his larger philosophical project and examining their impact on eighteenth--century British mathematics, Jesseph makes a major contribution to philosophy and to the history and philosophy of science.

The Foundations of Geometry and the Non-Euclidean Plane-Springer Science & Business Media

Grassmann Algebra Volume 1: Foundations Exploring extended vector algebra with Mathematica Grassmann algebra extends vector algebra by introducing the exterior product to algebraicize the notion of linear dependence. With it, vectors may be extended to higher-grade entities: bivectors, trivectors, ... multivectors. The extensive exterior product also has a regressive dual: the regressive product. The pair behaves a little like the Boolean duals of union and intersection. By interpreting one of the elements of the vector space as an origin point, points can be defined, and the exterior product can extend points into higher-grade located entities from which lines, planes and multiplanes can be defined. Theorems of Projective Geometry are simply formulae involving these entities and the dual products. By introducing the (orthogonal) complement operation, the scalar product of vectors may be extended to the interior product of multivectors, which in this more general case may no longer result in a scalar. The notion of the magnitude of vectors is extended to the magnitude of multivectors: for example, the magnitude of the exterior product of two vectors (a bivector) is the area of the parallelogram formed by them. To develop these foundational concepts, we need only consider entities which are the sums of elements of the same grade. This is the focus of this volume. But the entities of Grassmann algebra need not be of the same grade, and the possible product types need not be constricted to just the exterior, regressive and interior products. For example quaternion algebra is simply the Grassmann algebra of scalars and bivectors under a new product operation. Clifford, geometric and higher order hypercomplex algebras, for example the octonions, may be defined similarly. If to these we introduce Clifford's invention of a scalar which squares to zero, we can define entities (for example dual quaternions) with which we can perform elaborate transformations. Exploration of these entities, operations and algebras will be the focus of the volume to follow this. There is something fascinating about the beauty with which the mathematical structures that Hermann Grassmann discovered describe the physical world, and something also fascinating about how these beautiful structures have been largely lost to the mainstreams of mathematics and science. He wrote his seminal Ausdehnungslehre (Die Ausdehnungslehre. Vollständig und in strenger Form) in 1862. But it was not until the latter part of his life that he received any significant recognition for it, most notably by Gibbs and Clifford. In recent times David Hestenes' Geometric Algebra must be given the credit for much of the emerging awareness of Grassmann's innovation. In the hope that the book be accessible to scientists and engineers, students and professionals alike, the text attempts to avoid any terminology which does not make an essential contribution to an understanding of the basic concepts. Some familiarity with basic linear algebra may however be useful. The book is written using Mathematica, a powerful system for doing mathematics on a computer. This enables the theory to be cross-checked with computational explorations. However, a knowledge of Mathematica is not essential for an appreciation of Grassmann's beautiful ideas.

Demonstrates relationships between different types of geometry. Provides excellent overview of the foundations and historical evolution of geometrical concepts. Exercises (no solutions). Includes 98 illustrations.

This textbook introduces the basic notions of group theory by a thorough treatment of important examples, including complex numbers, modular arithmetic, symmetries, and permutations.

Practical examples to cryptography and coding theory are also included.

Michael Leyton has developed new foundations for geometry in which shape is equivalent to memory storage. A principal argument of these foundations is that artworks are maximal memory stores. The theory of geometry is developed from Leyton's fundamental laws of memory storage, and this book shows that these laws determine the structure of paintings. Furthermore, the book demonstrates that the emotion expressed by a painting is actually the memory extracted by the laws. Therefore, the laws of memory storage allow the systematic and rigorous mapping not only of the compositional structure of a painting, but also of its emotional expression. The argument is supported by detailed analyses of paintings by Picasso, Raphael, Cezanne, Gauguin, Modigliani, Ingres, De Kooning, Memling, Balthus and Holbein.

This monograph presents the basic concepts of hyperbolic Lobachevsky geometry and their possible applications to modern nonlinear applied problems in mathematics and physics, summarizing the findings of roughly the last hundred years. The central sections cover the classical building blocks of hyperbolic Lobachevsky geometry, pseudo spherical surfaces theory, net geometrical investigative techniques of nonlinear differential equations in partial derivatives, and their applications to the analysis of the physical models. As the sine-Gordon equation appears to have profound “geometrical roots” and numerous applications to modern nonlinear problems, it is treated as a universal “object” of investigation, connecting many of the problems discussed. The aim of this book is to form a general geometrical view on the different problems of modern mathematics, physics and natural science in general in the context of non-Euclidean hyperbolic geometry.

Now available from Waveland Press, the Third Edition of Roads to Geometry is appropriate for several kinds of students. Pre-service teachers of geometry are provided with a thorough yet accessible treatment of plane geometry in a historical context. Mathematics majors will find its axiomatic development sufficiently rigorous to provide a foundation for further study in the areas of Euclidean and non-Euclidean geometry. By using the SMSG postulate set as a basis for the development of plane geometry, the authors avoid the pitfalls of many “foundations of geometry” texts that encumber the reader with such a detailed development of preliminary results that many other substantive and elegant results are inaccessible in a one-semester course. At the end of each section is an ample collection of exercises of varying difficulty that provides problems that both extend and clarify results of that section, as well as problems that apply those results. At the end of chapters 3–7, a summary list of the new definitions and theorems of each chapter is included.

The Foundations of Geometry and the Non-Euclidean Plane-Springer Science & Business MediaThis book is a text for junior, senior, or first-year graduate courses traditionally titled Foundations of Geometry and/or Non Euclidean Geometry. The first 29 chapters are for a semester or year course on the foundations of geometry. The remaining chap ters may then be used for either a regular course or independent study courses. Another possibility, which is also especially suited for in-service teachers of high school geometry, is to survey the the fundamentals of absolute geometry (Chapters 1 -20) very quickly and begin earnest study with the theory of parallels and isometries (Chapters 21 -30). The text is self-contained, except that the elementary calculus is assumed for some parts of the material on advanced hyperbolic geometry (Chapters 31 -34). There are over 650 exercises, 30 of which are 10-part true-or-false questions. A rigorous ruler-and-protractor axiomatic development of the Euclidean and hyperbolic planes, including the classification of the isometries of these planes, is balanced by the discussion about this development. Models, such as Taxicab Geometry, are used exten sively to illustrate theory. Historical aspects and alternatives to the selected axioms are prominent. The classical axiom systems of Euclid and Hilbert are discussed, as are axiom systems for three and four-dimensional absolute geometry and Pieri's system based on rigid motions. The text is divided into three parts. The Introduction (Chapters 1 -4) is to be read as quickly as possible and then used for ref erence if necessary.Foundations of GeometryAddison-Wesley LongmanFoundations of Geometry, Second Edition is written to help enrich the education of all mathematics majors and facilitate a smooth transition into more advanced mathematics courses. The text also implements the latest national standards and recommendations regarding geometry for the preparation of high school mathematics teachers--and encourages students to make connections between their college courses and classes they will later teach. This text's coverage begins with Euclid's Elements, lays out a system of axioms for geometry, and then moves on to neutral geometry, Euclidian and hyperbolic geometries from an axiomatic point of view, and then non-Euclidean geometry. Good proof-writing skills are emphasized, along with a historical development of geometry. The Second Edition streamlines and reorganizes material in order to reach coverage of neutral geometry as early as possible, adds more exercises throughout, and facilitates use of the open-source software Geogebra. This text is ideal for an undergraduate course in axiomatic geometry for future high school geometry teachers, or for any student who has not yet encountered upper-level math, such as real analysis or abstract algebra. It assumes calculus and linear algebra as prerequisites.Fundamental Concepts of GeometryCourier Corporation-Demonstrates relationships between different types of geometry. Provides excellent overview of the foundations and historical evolution of geometrical concepts. Exercises (no solutions). Includes 98 illustrations.GeometryHolt McDougalEssentials of geometry -- Reasoning and proof -- Parallel and perpendicular lines -- Congruent triangles -- Relationships within triangles -- Similarity -- Right triangles and trigonometry -- Quadrilaterals -- Properties of transformations -- Properties of circles -- Measuring length and area -- Surface area and volume of solids.Riemannian GeometryWalter de GruyterThe series is devoted to the publication of monographs and high-level textbooks in mathematics, mathematical methods and their applications. Apart from covering important areas of current interest, a major aim is to make topics of an interdisciplinary nature accessible to the non-specialist. The works in this series are addressed to advanced students and researchers in mathematics and theoretical physics. In addition, it can serve as a guide for lectures and seminars on a graduate level. The series de Gruyter Studies in Mathematics was founded ca. 30 years ago by the late Professor Heinz Bauer and Professor Peter Gabriel with the aim to establish a series of monographs and textbooks of high standard, written by scholars with an international reputation presenting current fields of research in pure and applied mathematics. While the editorial board of the Studies has changed with the years, the aspirations of the Studies are unchanged. In times of rapid growth of mathematical knowledge carefully written monographs and textbooks written by experts are needed more than ever, not least to pave the way for the next generation of mathematicians. In this sense the editorial board and the publisher of the Studies are devoted to continue the Studies as a service to the mathematical community. Please submit any book proposals to Niels Jacob.Riemannian Geometric Statistics in Medical Image AnalysisAcademic PressOver the past 15 years, there has been a growing need in the medical image computing community for principled methods to process nonlinear geometric data. Riemannian geometry has emerged as one of the most powerful mathematical and computational frameworks for analyzing such data. Riemannian Geometric Statistics in Medical Image Analysis is a complete reference on statistics on Riemannian manifolds and more general nonlinear spaces with applications in medical image analysis. It provides an introduction to the core methodology followed by a presentation of state-of-the-art methods. Beyond medical image computing, the methods described in this book may also apply to other domains such as signal processing, computer vision, geometric deep learning, and other domains where statistics on geometric features appear. As such, the presented core methodology takes its place in the field of geometric statistics, the statistical analysis of data being elements of nonlinear geometric spaces. The foundational material and the advanced techniques presented in the later parts of the book can be useful in domains outside medical imaging and present important applications of geometric statistics methodology Content includes: The foundations of Riemannian geometric methods for statistics on manifolds with emphasis on concepts rather than on proofs Applications of statistics on manifolds and shape spaces in medical image computing Diffeomorphic deformations and their applications As the methods described apply to domains such as signal processing (radar signal processing and brain computer interaction), computer vision (object and face recognition), and other domains where statistics of geometric features appear, this book is suitable for researchers and graduate students in medical imaging, engineering and computer science. A complete reference covering both the foundations and state-of-the-art methods Edited and authored by leading researchers in the field Contains theory, examples, applications, and algorithms Gives an overview of current research challenges and future applicationsThe Foundations of GeometryMechanics in Differential GeometryWalter de GruyterLobachevsky Geometry and Modern Nonlinear ProblemsSpringerThis monograph presents the basic concepts of hyperbolic Lobachevsky geometry and their possible applications to modern nonlinear applied problems in mathematics and physics, summarizing the findings of roughly the last hundred years. The central sections cover the classical building blocks of hyperbolic Lobachevsky geometry, pseudo spherical surfaces theory, net geometrical investigative techniques of nonlinear differential equations in partial derivatives, and their applications to the analysis of the physical models. As the sine-Gordon equation appears to have profound “geometrical roots” and numerous applications to modern nonlinear problems, it is treated as a universal “object” of investigation, connecting many of the problems discussed. The aim of this book is to form a general geometrical view on the different problems of modern mathematics, physics and natural science in general in the context of non-Euclidean hyperbolic geometry.Stochastic Geometry, Spatial Statistics and Random FieldsAsymptotic MethodsSpringerThis volume provides a modern introduction to stochastic geometry, random fields and spatial statistics at a (post)graduate level. It is focused on asymptotic methods in geometric probability including weak and strong limit theorems for random spatial structures (point processes, sets, graphs, fields) with applications to statistics. Written as a contributed volume of lecture notes, it will be useful not only for students but also for lecturers and researchers interested in geometric probability and related subjects.Grassmann Algebra Volume 1: FoundationsExploring extended vector algebra with MathematicaJohn M Browne-Grassmann Algebra Volume 1: Foundations Exploring extended vector algebra with Mathematica Grassmann algebra extends vector algebra by introducing the exterior product to algebraicize the notion of linear dependence. With it, vectors may be extended to higher-grade entities: bivectors, trivectors, ... multivectors. The extensive exterior product also has a regressive dual: the regressive product. The pair behaves a little like the Boolean duals of union and intersection. By interpreting one of the elements of the vector space as an origin point, points can be defined, and the exterior product can extend points into higher-grade located entities from which lines, planes and multiplanes can be defined. Theorems of Projective Geometry are simply formulae involving these entities and the dual products. By introducing the (orthogonal) complement operation, the scalar product of vectors may be extended to the interior product of multivectors, which in this more general case may no longer result in a scalar. The notion of the magnitude of vectors is extended to the magnitude of multivectors: for example, the magnitude of the exterior product of two vectors (a bivector) is the area of the parallelogram formed by them. To develop these foundational concepts, we need only consider entities which are the sums of elements of the same grade. This is the focus of this volume. But the entities of Grassmann algebra need not be of the same grade, and the possible product types need not be constricted to just the exterior, regressive and interior products. For example quaternion algebra is simply the Grassmann algebra of scalars and bivectors under a new product operation. Clifford, geometric and higher order hypercomplex algebras, for example the octonions, may be defined similarly. If to these we introduce Clifford's invention of a scalar which squares to zero, we can define entities (for example dual quaternions) with which we can perform elaborate transformations. Exploration of these entities, operations and algebras will be the focus of the volume to follow this. There is something fascinating about the beauty with which the mathematical structures that Hermann Grassmann discovered describe the physical world, and something also fascinating about how these beautiful structures have been largely lost to the mainstreams of mathematics and science. He wrote his seminal Ausdehnungslehre (Die Ausdehnungslehre. Vollständig und in strenger Form) in 1862. But it was not until the latter part of his life that he received any significant recognition for it, most notably by Gibbs and Clifford. In recent times David Hestenes' Geometric Algebra must be given the credit for much of the emerging awareness of Grassmann's innovation. In the hope that the book be accessible to scientists and engineers, students and professionals alike, the text attempts to avoid any terminology which does not make an essential contribution to an understanding of the basic concepts. Some familiarity with basic linear algebra may however be useful. The book is written using Mathematica, a powerful system for doing mathematics on a computer. This enables the theory to be cross-checked with computational explorations. However, a knowledge of Mathematica is not essential for an appreciation of Grassmann's beautiful ideas.Continuous SymmetryFrom Euclid to KleinAmerican Mathematical Soc."This text is for a one-semester undergraduate course on geometry. It is richly illustrated and contains hundreds of exercises."--BOOK JACKET.Noncommutative Geometry and the Standard Model of Elementary Particle PhysicsSpringerThe outcome of a close collaboration between mathematicians and mathematical physicists, these lecture notes present the foundations of A. Connes noncommutative geometry as well as its applications in particular to the field of theoretical particle physics. The coherent and systematic approach makes this book useful for experienced researchers and postgraduate students alike.Larson Geometry Common Core AlabamaGeometry 2013EnVision Florida GeometryStudent CompanionFoundations of Game TheoryNoncooperative GamesBirkhäuserThe English edition differs only slightly from the Russian original. The main structural difference is that all the material on the theory of finite noncooperative games has been collected in Chapter 2, with renumbering of the material of the remain ing chapters. New sections have been added in this chapter: devoted to general questions of equilibrium theory in nondegenerate games, subsections 3.9-3.17, by N.N. Vorob'ev, Jr.; and § 4, by A.G. Chernyakov; and § 5, by N.N. Vorob'ev, Jr., on the computational complexity of the process of finding equilibrium points in finite games. It should also be mentioned that subsections 3.12-3.14 in Chapter 1 were written by E.B. Yanovskaya especially for the Russian edition. The author regrets that the present edition does not reflect the important game-theoretical achievements presented in the splendid monographs by E. van Damme (on the refinement of equilibrium principles for finite games), as well as those by J.e. Harsanyi and R. Selten, and by W. Giith and B. Kalkofen (on equilibrium selection). When the Russian edition was being written, these direc tions in game theory had not yet attained their final form, which appeared only in quite recent monographs; the present author has had to resist the temptation of attempting to produce an elementary exposition of the new theories for the English edition; readers of this edition will find only brief mention of the new material.Holt California GeometryHolt Rinehart & WinstonThe Baller

Teacher PlaybookHow to Empower Students, Increase Engagement, and Create the Culture You Want in Your ClassroomDoes your classroom run the way you want? Most people enter the teaching profession wanting to make a difference in young people's lives. However, more and more teachers feel lost, frustrated, and overwhelmed with everything they're required to do. It's hard to be successful without a clear plan on getting control of your classroom, empowering your students, and making the learning experience more enjoyable for you and your students. These 18 chapters are crucial for any educator who wants to take their teaching to the next level. Teacher, Principal, Director, Dean, and YouTube/TikTok teacher, Tyler Tarver knows that education is more than just standing in front of students lecturing them on a specific topic - it's a culture of learning that educators foster to train the next generation. If you are attempting to be the best educator you can in the environment you're in, you need ideas and encouragement from someone who's been exactly where you are. Even if you had the time, money, and support we know teachers deserve, we know that applying any knowledge always has a greater impact when you're able to give personal and practical application to the ideas you know matter. Besides sitting through 60+ hours a year of professional development, there is another way to incrementally improve your teaching week after week. Spoiler Alert: It can also be fun. Tyler Tarver learned how to create the culture he wanted in his classroom. He was able to pass this on to any educator who wanted to get excited about teaching and have a deeper impact on their students. He wrote The Baller Teacher Playbook to teach others what it takes to expand your teaching and create a community of happy and engaged learners. These short, weekly chapters and accompanying resources will add enormous value to your classroom and the school you work for. In this 18-week guide, readers will be introduced to the top areas where truly successful teachers and their students excel: Reason vs Excuses: How do you overcome the hurdles inherent in education? Fun: How do you get yourself and students excited about learning? Creativity: How do you create a culture where every day is unexpected but not chaotic? Positivity: How can we roll with the punches but not have to fake it? Authenticity: How can I be myself but genuinely connect with young people? Leadership: How do I get my students to lead without me? Collaboration: How do I work with my administrators, colleagues, and parents to better every student's education? Diversity: How do I help build empathy and understanding among myself and my students? Development: How am I always getting better? Plus more! The Baller Teacher Playbook is the must-have guide for anyone who feels lost or overwhelmed by the current educational climate, even if they have been teaching for years. Learn from a fellow educator who had their fair share of mistakes and successes through the simple but effective tactics shared in these pages. Take things further: If you want to move forward even faster as an educational professional, read a chapter once a week with your team, and come together at weekly meetings to discuss experience, ideas, triumphs, and a community of educators trying to improve themselves and their classroom.Continuous GeometryPrinceton University PressIn his work on rings of operators in Hilbert space, John von Neumann discovered a new mathematical structure that resembled the lattice system Ln. In characterizing its properties, von Newmann founded the field of continuous geometry. For students and researchers interested in ring theory or projective geometries, von Neumann discusses his findings and their applications.Relativistic CosmologyCambridge University PressCosmology has been transformed by dramatic progress in high-precision observations and theoretical modelling. This book surveys key developments and open issues for graduate students and researchers. Using a relativistic geometric approach, it focuses on the general concepts and relations that underpin the standard model of the Universe. Part I covers foundations of relativistic cosmology whilst Part II develops the dynamical and observational relations for all models of the Universe based on general relativity. Part III focuses on the standard model of cosmology, including inflation, dark matter, dark energy, perturbation theory, the cosmic microwave background, structure formation and gravitational lensing. It also examines modified gravity and inhomogeneity as possible alternatives to dark energy. Anisotropic and inhomogeneous models are described in Part IV, and Part V reviews deeper issues, such as quantum cosmology, the start of the universe and the multiverse proposal. Colour versions of some figures are available at www.cambridge.org/9780521381154.Group Theoretical Foundations of Quantum MechanicsiUniverseQuantum mechanics, its properties including wavefunctions, complex numbers and uncertainty, are necessary and completely reasonable and understandable, with no weirdness. Classical physics is impossible. Much uncertainty comes from Fourier analysis. Waves and particles and collapse of wavefunctions are meaningless. Their seeming appearance in analyzed. Reasons and limitations of superposition are considered. Gravitation is an example of nonlinearity. All objects interact so nonlinearity is universal. How quantum mechanics then fits in is shown. Dirac's equation comes from Poincaré group. Physics is necessarily impossible in any space but that with dimension 3+1. Spin-statistics is a property of rotation groups.New Foundations for Classical MechanicsSpringer Science & Business MediaThis is a textbook on classical mechanics at the intermediate level, but its main purpose is to serve as an introduction to a new mathematical language for physics called geometric algebra. Mechanics is most commonly formulated today in terms of the vector algebra developed by the American physicist J. Willard Gibbs, but for some applications of mechanics the algebra of complex numbers is more efficient than vector algebra, while in other applica tions matrix algebra works better. Geometric algebra integrates all these algebraic systems into a coherent mathematical language which not only retains the advantages of each special algebra but possesses powerful new capabilities. This book covers the fairly standard material for a course on the mechanics of particles and rigid bodies. However, it will be seen that geometric algebra brings new insights into the treatment of nearly every topic and produces simplifications that move the subject quickly to advanced levels. That has made it possible in this book to carry the treatment of two major topics in mechanics well beyond the level of other textbooks. A few words are in order about the unique treatment of these two topics, namely, rotational dynamics and celestial mechanics.Roads to GeometryThird EditionWaveland PressNow available from Waveland Press, the Third Edition of Roads to Geometry is appropriate for several kinds of students. Pre-service teachers of geometry are provided with a thorough yet accessible treatment of plane geometry in a historical context. Mathematics majors will find its axiomatic development sufficiently rigorous to provide a foundation for further study in the areas of Euclidean and non-Euclidean geometry. By using the SMSG postulate set as a basis for the development of plane geometry, the authors avoid the pitfalls of many “foundations of geometry” texts that encumber the reader with such a detailed development of preliminary results that many other substantive and elegant results are inaccessible in a one-semester course. At the end of each section is an ample collection of exercises of varying difficulty that provides problems that both extend and clarify results of that section, as well as problems that apply those results. At the end of chapters 3–7, a summary list of the new definitions and theorems of each chapter is included.GeometryTennesseeHolt McDougalNew Foundations for Classical MechanicsSpringer Science & Business Media(revised) This is a textbook on classical mechanics at the intermediate level, but its main purpose is to serve as an introduction to a new mathematical language for physics called geometric algebra. Mechanics is most commonly formulated today in terms of the vector algebra developed by the American physicist J. Willard Gibbs, but for some applications of mechanics the algebra of complex numbers is more efficient than vector algebra, while in other applications matrix algebra works better. Geometric algebra integrates all these algebraic systems into a coherent mathematical language which not only retains the advantages of each special algebra but possesses powerful new capabilities. This book covers the fairly standard material for a course on the mechanics of particles and rigid bodies. However, it will be seen that geometric algebra brings new insights into the treatment of nearly every topic and produces simplifications that move the subject quickly to advanced levels. That has made it possible in this book to carry the treatment of two major topics in mechanics well beyond the level of other textbooks. A few words are in order about the unique treatment of these two topics, namely, rotational dynamics and celestial mechanics.Foundations of Geometric CognitionRoutledgeThe cognitive foundations of geometry have puzzled academics for a long time, and even today are mostly unknown to many scholars, including mathematical cognition researchers. Foundations of Geometric Cognition shows that basic geometric skills are deeply hardwired in the visuospatial cognitive capacities of our brains, namely spatial navigation and object recognition. These capacities, shared with non-human animals and appearing in early stages of the human ontogeny, cannot, however, fully explain a uniquely human form of geometric cognition. In the book, Hohol argues that Euclidean geometry would not be possible without the human capacity to create and use abstract concepts, demonstrating how language and diagrams provide cognitive scaffolding for abstract geometric thinking, within a context of a Euclidean system of thought. Taking an interdisciplinary approach and drawing on research from diverse fields including psychology, cognitive science, and mathematics, this book is a must-read for cognitive psychologists and cognitive scientists of mathematics, alongside anyone interested in mathematical education or the philosophical and historical aspects of geometry.Foundations of Algebraic Geometry. --; 29Hassell Street PressThis work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.Shape as MemoryA Geometric Theory of ArchitectureWalter de GruyterHow do buildings store information and experience in their shape and form? Michael Leyton has attracted considerable attention with his interpretation of geometrical form as a medium for the storage of information and memory. In this publication he draws specific conclusions for the field of architecture and construction, attaching fundamental importance to the complex relationship between symmetry and asymmetry. Wie können Gebäudeformen Erfahrungen und Inhalte speichern? Leyton hat eine viel beachtete neue Theorie der geometrischen Form entwickelt. Er interpretiert die geometrische Form – im Gegensatz zur gesamten Tradition – als Informations- und Gedächtnisträger. In vorliegender Darstellung zieht er die spezifischen Konsequenzen davon für den Bereich der Architektur und des Bauens.Foundations of GeometryCourier CorporationExplains geometric theories and shows many examples.Theory of Flexible ShellsElsevierEngineers and researchers concerned with the problems of thin-walled structures have a choice of books on shell theory. However, the almost exclusive concern of these books are shells designed for maximum strength and stiffness. Shells which are designed for maximum elastic displacements (flexible shells) have been used in industry for decades, but are largely ignored in shell-theory books due to tradition and to the wide variety of shapes and problems involved. This book presents the general theory of elastic shells and the deformation inherent in flexibility. For the analysis of stability of the two-dimensionally variable large elastic deformations, a local approach is developed. The specialized theory is then applied to the basic problems of flexible shells - tubes, open--section beams and shells of revolution. The results of parametric studies are presented in numerous graphs.New Foundations in MathematicsThe Geometric Concept of NumberSpringer Science & Business MediaThe first book of its kind, New Foundations in Mathematics: The Geometric Concept of Number uses geometric algebra to present an innovative approach to elementary and advanced mathematics. Geometric algebra offers a simple and robust means of expressing a wide range of ideas in mathematics, physics, and engineering. In particular, geometric algebra extends the real number system to include the concept of direction, which underpins much of modern mathematics and physics. Much of the material presented has been developed from undergraduate courses taught by the author over the years in linear algebra, theory of numbers, advanced calculus and vector calculus, numerical analysis, modern abstract algebra, and differential geometry. The principal aim of this book is to present these ideas in a freshly coherent and accessible manner. New Foundations in Mathematics will be of interest to undergraduate and graduate students of mathematics and physics who are looking for a unified treatment of many important geometric ideas arising in these subjects at all levels. The material can also serve as a supplemental textbook in some or all of the areas mentioned above and as a reference book for professionals who apply mathematics to engineering and computational areas of mathematics and physics.Cultural Foundations of MathematicsThe Nature of Mathematical Proof and the Transmission of the Calculus from India to Europe in the 16th C. CEPearson Education IndiaThe Volume Examines, In Depth, The Implications Of Indian History And Philosophy For Contemporary Mathematics And Science. The Conclusions Challenge Current Formal Mathematics And Its Basis In The Western Dogma That Deduction Is Infallible (Or That It Is Less Fallible Than Induction). The Development Of The Calculus In India, Over A Thousand Years, Is Exhaustively Documented In This Volume, Along With Novel Insights, And Is Related To The Key Sources Of Wealth-Monsoon-Dependent Agriculture And Navigation Required For Overseas Trade - And The Corresponding Requirement Of Timekeeping. Refecting The Usual Double Standard Of Evidence Used To Construct Eurocentric History, A Single, New Standard Of Evidence For Transmissions Is Proposed. Using This, It Is Pointed Out That Jesuits In Cochin, Following The Toledo Model Of Translation, Had Long-Term Opportunity To Transmit Indian Calculus Texts To Europe. The European Navigational Problem Of Determining Latitude, Longitude, And Loxodromes, And The 1582 Gregorian Calendar-Reform, Provided Ample Motivation. The Mathematics In These Earlier Indian Texts Suddenly Starts Appearing In European Works From The Mid-16Th Century Onwards, Providing Compelling Circumstantial Evidence. While The Calculus In India Had Valid Pramana, This Differed From Western Notions Of Proof, And The Indian (Algorismus) Notion Of Number Differed From The European (Abacus) Notion. Hence, Like Their Earlier Difficulties With The Algorismus, Europeans Had Difficulties In Understanding The Calculus, Which, Like Computer Technology, Enhanced The Ability To Calculate, Albeit In A Way Regarded As Epistemologically Insecure. Present-Day Difficulties In Learning Mathematics Are Related, Via Phylogeny Is Ontogeny , To These Historical Difficulties In Assimilating Imported Mathematics. An Appendix Takes Up Further Contemporary Implications Of The New Philosophy Of Mathematics For The Extension Of The Calculus, Which Is Needed To Handle The Infinities Arising In The Study Of Shock Waves And The Renormalization Problem Of Quantum Field Theory.Topics in Integral GeometryWorld Scientific Publishing CompanyEssentials of integral geometry in a homogenous space are presented and the focus is on the basic results and applications. This book provides the readers with new findings, some being published for the first time and serves as an excellent graduate text. Request Inspection CopyAlgebraic GeometrySpringer Science & Business Me-

diaThis book provides an introduction to abstract algebraic geometry. It includes more than 400 exercises that offer specific examples as well as more specialized topics. From the reviews: "Enables the reader to make the drastic transition between the basic, intuitive questions about affine and projective varieties with which the subject begins, and the elaborate general methodology of schemes and cohomology employed currently to answer these questions." --MATHEMATICAL REVIEWSA Bibliography of Bertrand RussellVolume I: Separate Publications, 1896-1990RoutledgeFrom 1895, the year he published his first signed article, to four days before his death in 1970 when he wrote his last, Bertrand Russell was a powerful force in the world of mathematics, philosophy, human rights and the struggle for peace. During those years he published 70 books, almost as many pamphlets and over 2,000 articles, he also contributed pieces to some 200 books. The availability of the Bertrand Russell Archives at McMaster University since 1968 has made it possible for the first time to compile a full, descriptive bibliography of his writings. The Collected Papers are based on it. Fully annotated, the Bibliography is textually oriented and will guide the scholar, collector and general reader to the authoritative editions of Russell's works. It includes references to the locations of all known speeches and interviews, and reproductions of the dust-jackets of Russell's books. Blackwell, Ruja and Turcon have cooperated for nearly 20 years on the new Bibliography. Lord Russell saw the extensive additions for it near the end of his life and declared: `I am impressed.'Berkeley's Philosophy of MathematicsUniversity of Chicago PressIn this first modern, critical assessment of the place of mathematics in Berkeley's philosophy and Berkeley's place in the history of mathematics, Douglas M. Jesseph provides a bold reinterpretation of Berkeley's work. Jesseph challenges the prevailing view that Berkeley's mathematical writings are peripheral to his philosophy and argues that mathematics is in fact central to his thought, developing out of his critique of abstraction. Jesseph's argument situates Berkeley's ideas within the larger historical and intellectual context of the Scientific Revolution. Jesseph begins with Berkeley's radical opposition to the received view of mathematics in the philosophy of the late seventeenth and early eighteenth centuries, when mathematics was considered a "science of abstractions." Since this view seriously conflicted with Berkeley's critique of abstract ideas, Jesseph contends that he was forced to come up with a nonabstract philosophy of mathematics. Jesseph examines Berkeley's unique treatments of geometry and arithmetic and his famous critique of the calculus in The Analyst. By putting Berkeley's mathematical writings in the perspective of his larger philosophical project and examining their impact on eighteenth-century British mathematics, Jesseph makes a major contribution to philosophy and to the history and philosophy of science.Elementary Abstract Algebra, Examples and Applications Volume 1: FoundationsLulu.comThis textbook introduces the basic notions of group theory by a thorough treatment of important examples, including complex numbers, modular arithmetic, symmetries, and permutations. Practical examples to cryptography and coding theory are also included.The Structure of PaintingsSpringerMichael Leyton has developed new foundations for geometry in which shape is equivalent to memory storage. A principal argument of these foundations is that artworks are maximal memory stores. The theory of geometry is developed from Leyton's fundamental laws of memory storage, and this book shows that these laws determine the structure of paintings. Furthermore, the book demonstrates that the emotion expressed by a painting is actually the memory extracted by the laws. Therefore, the laws of memory storage allow the systematic and rigorous mapping not only of the compositional structure of a painting, but also of its emotional expression. The argument is supported by detailed analyses of paintings by Picasso, Raphael, Cezanne, Gauguin, Modigliani, Ingres, De Kooning, Memling, Balthus and Holbein.GeometryCommon CoreAdditive and Polynomial RepresentationsAcademic PressAdditive and Polynomial Representations deals with major representation theorems in which the qualitative structure is reflected as some polynomial function of one or more numerical functions defined on the basic entities. Examples are additive expressions of a single measure (such as the probability of disjoint events being the sum of their probabilities), and additive expressions of two measures (such as the logarithm of momentum being the sum of log mass and log velocity terms). The book describes the three basic procedures of fundamental measurement as the mathematical pivot, as the utilization of constructive methods, and as a series of isomorphism theorems leading to consistent numerical solutions. The text also explains the counting of units in relation to an empirical relational structure which contains a concatenation operation. The book notes some special variants which arise in connection with relativity and thermodynamics. The text cites examples from physics and psychology for which additive conjoint measurement provides a possible method of fundamental measurement. The book will greatly benefit mathematicians, econometricians, and academicians in advanced mathematics or physics.