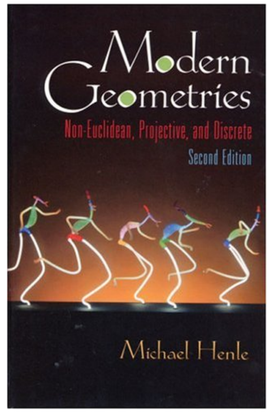

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Modern Geometries-Michael Henle 2001 Engaging, accessible, and extensively illustrated, this brief, but solid introduction to modern geometry describes geometry as it is understood and used by contemporary mathematicians and theoretical scientists. Basically non-Euclidean in approach, it relates geometry to familiar ideas from analytic geometry, staying firmly in the Cartesian plane. It uses the principle geometric concept of congruence or geometric transformation--introducing and using the Erlanger Program explicitly throughout. It features significant modern applications of geometry--e.g., the geometry of relativity, symmetry, art and crystallography, finite geometry and computation. Covers a full range of topics from plane geometry, projective geometry, solid geometry, discrete geometry, and axiom systems. For anyone interested in an introduction to geometry used by contemporary mathematicians and theoretical scientists.

Modern Geometry with Applications-George A. Jennings 2012-12-06 This introduction to modern geometry differs from other books in the field due to its emphasis on applications and its discussion of special relativity as a major example of a non-Euclidean geometry. Additionally, it covers the two important areas of non-Euclidean geometry, spherical geometry and projective geometry, as well as emphasising transformations, and conics and planetary orbits. Much emphasis is placed on applications throughout the book, which motivate the topics, and many additional applications are given in the exercises. It makes an excellent introduction for those who need to know how geometry is used in addition to its formal theory.

A Course in Modern Geometries-Judith N. Cederberg 2013-03-09 A Course in Modern Geometries is designed for a junior-senior level course for mathematics majors, including those who plan to teach in secondary school. Chapter 1 presents several finite geometries in an axiomatic framework. Chapter 2 introduces Euclid's geometry and the basic ideas of non-Euclidean geometry. The synthetic approach of Chapters 1 - 2 is followed by the analytic treatment of transformations of the Euclidean plane in Chapter 3. Chapter 4 presents plane projective geometry both synthetically and analytically. The extensive use of matrix representations of groups of transformations in Chapters 3 - 4 reinforces ideas from linear algebra and serves as excellent preparation for a course in abstract algebra. Each chapter includes a list of suggested sources for applications and/or related topics.

A Modern View of Geometry-Leonard M. Blumenthal 2017-04-19 Elegant exposition of postulation geometry of planes offers rigorous, lucid treatment of coordination of affine and projective planes, set theory, propositional calculus, affine planes with Desargues and Pappus properties, more. 1961 edition.

Euclidean and Non-Euclidean Geometry-Patrick J. Ryan 1986-06-27 A thorough analysis of the fundamentals of plane geometry The reader is provided with an abundance of geometrical facts such as the classical results of plane Euclidean and non-Euclidean geometry, congruence theorems, concurrence theorems, classification of isometries, angle addition, trigonometrical formulas, etc.

Modern Geometries-James R. Smart 1998 This comprehensive, best-selling text focuses on the study of many different geometries -- rather than a single geometry -- and is thoroughly modern in its approach. Each chapter is essentially a short course on one aspect of modern geometry, including finite geometries, the geometry of transformations, convexity, advanced Euclidian geometry, inversion, projective geometry, geometric aspects of topology, and non-Euclidean geometries. This edition reflects the recommendations of the COMAP proceedings on Geometry's Future, the NCTM standards, and the Professional Standards for Teaching Mathematics. References to a new companion text, Active Geometry by David A. Thomas encourage students to explore the geometry of motion through the use of computer software. Using Active Geometry at the beginning of various sections allows professors to give students a somewhat more intuitive introduction using current technology before moving on to more abstract concepts and theorems.

Geometry Through History-Meighan I. Dillon 2018-03-21 Presented as an engaging discourse, this textbook invites readers to delve into the historical origins and uses of geometry. The narrative traces the influence of Euclid’s system of geometry, as developed in his classic text The Elements, through the Arabic period, the modern era in the West, and up to twentieth century mathematics. Axioms and proof methods used by mathematicians from those periods are explored alongside the problems in Euclidean geometry that lead to their work. Students cultivate skills applicable to much of modern mathematics through sections that integrate concepts like projective and hyperbolic geometry with representative proof-based exercises. For its sophisticated account of ancient to modern geometries, this text assumes only a year of college mathematics as it builds towards its conclusion with algebraic curves and quaternions. Euclid’s work has affected geometry for thousands of years, so this text has something to offer to anyone who wants to broaden their appreciation for the field.

Introduction to Projective Geometry-C. R. Wylie 2011-09-12 This introductory volume offers strong reinforcement for its teachings, with detailed examples and numerous theorems, proofs, and exercises, plus complete answers to all odd-numbered end-of-chapter problems. 1970 edition.

A Course in Modern Geometries-Judith N. Cederberg 2013-03-09 Designed for a junior-senior level course for mathematics majors, including those who plan to teach in secondary school. The first chapter presents several finite geometries in an axiomatic framework, while Chapter 2 continues the synthetic approach in introducing both Euclids and ideas of non-Euclidean geometry. There follows a new introduction to symmetry and hands-on explorations of isometries that precedes an extensive analytic treatment of similarities and affinities. Chapter 4 presents plane projective geometry both synthetically and analytically, and the new Chapter 5 uses a descriptive and exploratory approach to introduce chaos theory and fractal geometry, stressing the self-similarity of fractals and their generation by transformations from Chapter 3. Throughout, each chapter includes a list of suggested resources for applications or related topics in areas such as art and history, plus this second edition points to Web locations of author-developed guides for dynamic software explorations of the Poincaré model, isometries, projectivities, conics and fractals. Parallel versions are available for "Cabri Geometry" and "Geometers Sketchpad".

A History of Non-Euclidean Geometry-Boris A. Rosenfeld 2012-09-08 The Russian edition of this book appeared in 1976 on the hundred-and-fiftieth anniversary of the historic day of February 23, 1826, when Lobaevskiĭ delivered his famous lecture on his discovery of non-Euclidean geometry. The importance of the discovery of non-Euclidean geometry goes far beyond the limits of geometry itself. It is safe to say that it was a turning point in the history of all mathematics. The scientific revolution of the seventeenth century marked the transition from "mathematics of constant magnitudes" to "mathematics of variable magnitudes. " During the seventies of the last century there occurred another scientific revolution. By that time mathematicians had become familiar with the ideas of non-Euclidean geometry and the algebraic ideas of group and field (all of which appeared at about the same time), and the (later) ideas of set theory. This gave rise to many geometries in addition to the Euclidean geometry previously regarded as the only conceivable possibility, to the arithmetics and algebras of many groups and fields in addition to the arith metic and algebra of real and complex numbers, and, finally, to new mathe matical systems, i. e. , sets furnished with various structures having no classical analogues. Thus in the 1870's there began a new mathematical era usually called, until the middle of the twentieth century, the era of modern mathe matics.

Journey into Geometries-Marta Sved 2020-07-31

A Combinatorial Introduction to Topology-Michael Henle 1994-01-01 Excellent text covers vector fields, plane homology and the Jordan Curve Theorem, surfaces, homology of complexes, more. Problems and exercises. Some knowledge of differential equations and multivariate calculus required.Bibliography. 1979 edition.

Geometry-David A. Brannan 2011-12-22 This richly illustrated and clearly written undergraduate textbook captures the excitement and beauty of geometry. The approach is that of Klein in his Erlangen programme: a geometry is a space together with a set of transformations of the space. The authors explore various geometries: affine, projective, inversive, hyperbolic and elliptic. In each case they carefully explain the key results and discuss the relationships between the geometries. New features in this second edition include concise end-of-chapter summaries to aid student revision, a list of further reading and a list of special symbols. The authors have also revised many of the end-of-chapter exercises to make them more challenging and to include some interesting new results. Full solutions to the 200 problems are included in the text, while complete solutions to all of the end-of-chapter exercises are available in a new Instructors' Manual, which can be downloaded from www.cambridge.org/9781107647831.

Library of Congress Subject Headings-Library of Congress 2006

Analytic Projective Geometry-Eduardo Casas-Alvero 2014 Projective geometry is concerned with the properties of figures that are invariant by projecting and taking sections. It is considered one of the most beautiful parts of geometry and plays a central role because its specializations cover the whole of the affine, Euclidean and non-Euclidean geometries. The natural extension of projective geometry is projective algebraic geometry, a rich and active field of research. The results and techniques of projective geometry are intensively used in computer vision. This book contains a comprehensive presentation of projective geometry, over the real and complex number fields, and its applications to affine and Euclidean geometries. It covers central topics such as linear varieties, cross ratio, duality, projective transformations, quadrics and their classifications--projective, affine and metric--as well as the more advanced and less usual spaces of quadrics, rational normal curves, line complexes and the classifications of collineations, pencils of quadrics and correlations. Two appendices are devoted to the projective foundations of perspective and to the projective models of plane non-Euclidean geometries. The book uses modern language, is based on linear algebra, and provides complete proofs. Exercises are proposed at the end of each chapter; many of them are beautiful classical results. The material in this book is suitable for courses on projective geometry for undergraduate students, with a working knowledge of a standard first course on linear algebra. The text is a valuable guide to graduate students and researchers working in areas using or related to projective geometry, such as algebraic geometry and computer vision, and to anyone looking for an advanced view of geometry as a whole.

Euclidean and Non-euclidean Geometries-Maria Helena Noronha 2002 This book develops a self-contained treatment of classical Euclidean geometry through both axiomatic and analytic methods. Concise and well organized, it prompts readers to prove a theorem yet provides them with a framework for doing so. Chapter topics cover neutral geometry, Euclidean plane geometry, geometric transformations, Euclidean 3-space, Euclidean n-space; perimeter, area and volume; spherical geometry; hyperbolic geometry; models for plane geometries; and the hyperbolic metric.

Projective Geometry-H.S.M. Coxeter 2003-10-09 In Euclidean geometry, constructions are made with ruler and compass. Projective geometry is simpler: its constructions require only a ruler. In projective geometry one never measures anything, instead, one relates one set of points to another by a projectivity. The first two chapters of this book introduce the important concepts of the subject and provide the logical foundations. The third and fourth chapters introduce the famous theorems of Desargues and Pappus. Chapters 5 and 6 make use of projectivities on a line and plane, respectively. The next three chapters develop a self-contained account of von Staudt's approach to the theory of conics. The modern approach used in that development is exploited in Chapter 10, which deals with the simplest finite geometry that is rich enough to illustrate all the theorems nontrivially. The concluding chapters show the connections among projective, Euclidean, and analytic geometry.

Problems and Solutions in Euclidean Geometry-M. N. Aref 2010 Based on classical principles, this book is intended for a second course in Euclidean geometry and can be used as a refresher. Each chapter covers a different aspect of Euclidean geometry, lists relevant theorems and corollaries, and states and proves many propositions. Includes more than 200 problems, hints, and solutions. 1968 edition.

Geometries-Alekseĭ Bronislavovich Sosinskiĭ 2012 The book is an innovative modern exposition of geometry, or rather, of geometries; it is the first textbook in which Felix Klein's Erlangen Program (the action of transformation groups) is systematically used as the basis for defining various geometries. The course of study presented is dedicated to the proposition that all geometries are created equal--although some, of course, remain more equal than others. The author concentrates on several of the more distinguished and beautiful ones, which include what he terms ``toy geometries'', the geometries of Platonic bodies, discrete geometries, and classical continuous geometries. The text is based on first-year semester course lectures delivered at the Independent University of Moscow in 2003 and 2006. It is by no means a formal algebraic or analytic treatment of geometric topics, but rather, a highly visual exposition containing upwards of 200 illustrations. The reader is expected to possess a familiarity with elementary Euclidean geometry, albeit those lacking this knowledge may refer to a compendium in Chapter 0. Per the author's predilection, the book contains very little regarding the axiomatic approach to geometry (save for a single chapter on the history of non-Euclidean geometry), but two Appendices provide a detailed treatment of Euclid's and Hilbert's axiomatics. Perhaps the most important aspect of this course is the problems, which appear at the end of each chapter and are supplemented with answers at the conclusion of the text. By analyzing and solving these problems, the reader will become capable of thinking and working geometrically, much more so than by simply learning the theory. Ultimately, the author makes the distinction between concrete mathematical objects called ``geometries'' and the singular ``geometry'', which he understands as a way of thinking about mathematics. Although the book does not address branches of mathematics and mathematical physics such as Riemannian and Kahler manifolds or, say, differentiable manifolds and conformal field theories, the ideology of category language and transformation groups on which the book is based prepares the reader for the study of, and eventually, research in these important and rapidly developing areas of contemporary mathematics.

Thinking Geometrically-Thomas Q. Sibley 2015-08-14 Thinking Geometrically: A Survey of Geometries is a well written and comprehensive survey of college geometry that would serve a wide variety of courses for both mathematics majors and mathematics education majors. Great care and attention is spent on developing visual insights and geometric intuition while stressing the logical structure, historical development, and deep interconnectedness of the ideas. Students with less mathematical preparation than upper-division mathematics majors can successfully study the topics needed for the preparation of high school teachers. There is a multitude of exercises and projects in those chapters developing all aspects of geometric thinking for these students as well as for more advanced students. These chapters include Euclidean Geometry, Axiomatic Systems and Models, Analytic Geometry, Transformational Geometry, and Symmetry. Topics in the other chapters, including Non-Euclidean Geometry, Projective Geometry, Finite Geometry, Differential Geometry, and Discrete Geometry, provide a broader view of geometry. The different chapters are as independent as possible, while the text still manages to highlight the many connections between topics. The text is self-contained, including appendices with the material in Euclid’s first book and a high school axiomatic system as well as Hilbert’s axioms. Appendices give brief summaries of the parts of linear algebra and multivariable calculus needed for certain chapters. While some chapters use the language of groups, no prior experience with abstract algebra is presumed. The text will support an approach emphasizing dynamical geometry software without being tied to any particular software.

Sophus Lie and Felix Klein-Lizhen Ji 2015 The Erlangen program expresses a fundamental point of view on the use of groups and transformation groups in mathematics and physics. This volume is the first modern comprehensive book on that program and its impact in contemporary mathematics and physics. Klein spelled out the program, and Lie, who contributed to its formulation, is the first mathematician who made it effective in his work. The theories that these two authors developed are also linked to their personal history and to their relations with each other and with other mathematicians, incuding Hermann Weyl, Elie Cartan, Henri Poincare, and many others. All these facets of the Erlangen program appear in this volume. The book is written by well-known experts in geometry, physics and the history of mathematics and physics.

An Axiomatic Approach to Geometry-Francis Borceux 2013-10-31 Focusing methodologically on those historical aspects that are relevant to supporting intuition in axiomatic approaches to geometry, the book develops systematic and modern approaches to the three core aspects of axiomatic geometry: Euclidean, non-Euclidean and projective. Historically, axiomatic geometry marks the origin of formalized mathematical activity. It is in this discipline that most historically famous problems can be found, the solutions of which have led to various presently very active domains of research, especially in algebra. The recognition of the coherence of two-by-two contradictory axiomatic systems for geometry (like one single parallel, no parallel at all, several parallels) has led to the emergence of mathematical theories based on an arbitrary system of axioms, an essential feature of contemporary mathematics. This is a fascinating book for all those who teach or study axiomatic geometry, and who are interested in the history of geometry or who want to see a complete proof of one of the famous problems encountered, but not solved, during their studies: circle squaring, duplication of the cube, trisection of the angle, construction of regular polygons, construction of models of non-Euclidean geometries, etc. It also provides hundreds of figures that support intuition. Through 35 centuries of the history of geometry, discover the birth and follow the evolution of those innovative ideas that allowed humankind to develop so many aspects of contemporary mathematics. Understand the various levels of rigor which successively established themselves through the centuries. Be amazed, as mathematicians of the 19th century were, when observing that both an axiom and its contradiction can be chosen as a valid basis for developing a mathematical theory. Pass through the door of this incredible world of axiomatic mathematical theories!

Introduction to Non-Euclidean Geometry-Harold E. Wolfe 2013-09-26 College-level text for elementary courses covers the fifth postulate, hyperbolic plane geometry and trigonometry, and elliptic plane geometry and trigonometry. Appendixes offer background on Euclidean geometry. Numerous exercises. 1945 edition.

A Participatory Approach to Modern Geometry-Jay Kappraff 2014-08-25 This book aims to make the subject of geometry and its applications easy and comfortable to understand by students majoring in mathematics or the liberal arts, architecture and design. It can be used to teach students at different levels of computational ability and there is also sufficient novel material to interest students at a higher cognitive level. While the book goes deeply into the applications of geometry, it contains much introductory material which up to now may not have been known to the student. The constructive approach using compass and straightedge engages students, not just on an intellectual level, but also at a tactile level. This may be the only rigorous book offering geometry that attempts to engage students outside of the mathematics discipline.

Modern Geometry with Applications-George Jennings 1994 This is an introduction to the theory and applications of modern geometry. It differs from other books in its field in its emphasis on applications and its discussion of Special Relativity as a major example of a non-Euclidean geometry. Besides Special Relativity, it covers two other important areas of non-Euclidean geometry: spherical geometry (used in navigation and astronomy) and projective geometry (used in art). In addition, it reviews many useful topics from Euclidean geometry, emphasizing transformations, and includes a chapter on conics and planetary orbits. Applications are stressed throughout the book. Every topic is motivated by an application and many additional applications are given in the exercises. The book would be an excellent introduction to higher geometry for those students, especially prospective mathematics and teachers, who need to know how geometry is used in addition to its formal theory.

Geometry and Its Applications-Walter A. Meyer 2006-02-21 Meyer's Geometry and Its Applications, Second Edition, combines traditional geometry with current ideas to present a modern approach that is grounded in real-world applications. It balances the deductive approach with discovery learning, and introduces axiomatic, Euclidean geometry, non-Euclidean geometry, and transformational geometry. The text integrates applications and examples throughout and includes historical notes in many chapters. The Second Edition of Geometry and Its Applications is a significant text for any college or university that focuses on geometry's usefulness in other disciplines. It is especially appropriate for engineering and science majors, as well as future mathematics teachers. Realistic applications integrated throughout the text, including (but not limited to): Symmetries of artistic patterns Physics Robotics Computer vision Computer graphics Stability of architectural structures Molecular biology Medicine Pattern recognition Historical notes included in many chapters

Geometry of Complex Numbers-Hans Schwerdtfeger 2012-05-23 Illuminating, widely praised book on analytic geometry of circles, the Moebius transformation, and 2-dimensional non-Euclidean geometries.

The Real Projective Plane-H.S.M. Coxeter 2012-12-06 Along with many small improvements, this revised edition contains van Yzeren's new proof of Pascal's theorem ($1.7) and, in Chapter 2, an improved treatment of order and sense. The Sylvester-Gallai theorem, instead of being introduced as a curiosity, is now used as an essential step in the theory of harmonic separation (§3.34). This makes the logi cal development self-contained: the footnotes involving the References (pp. 214-216) are for comparison with earlier treatments, and to give credit where it is due, not to fill gaps in the argument. H.S.M.C. November 1992 v Preface to the Second Edition Why should one study the real plane? To this question, put by those who advocate the complex plane, or geometry over a general field, I would reply that the real plane is an easy first step. Most of the prop erties are closely analogous, and the real field has the advantage of intuitive accessibility. Moreover, real geometry is exactly what is needed for the projective approach to non- Euclidean geometry. Instead of introducing the affine and Euclidean metrics as in Chapters 8 and 9, we could just as well take the locus of 'points at infinity' to be a conic, or replace the absolute involution by an absolute polarity.

Sources of Hyperbolic Geometry-John Stillwell 1996 This book presents, for the first time in English, the papers of Beltrami, Klein, and Poincar that brought hyperbolic geometry into the mainstream of mathematics. By placing the works of these three mathematicians side by side and providing commentaries, this book gives the student, historian, or professional geometer a bird's-eye view of one of the great episodes in mathematics. The unified setting and historical context reveal the insights of Beltrami, Klein, and Poincar in their full brilliance.

Non-Euclidean Geometry-H. S. M. Coxeter 1965-12 This textbook introduces non-Euclidean geometry, and the third edition adds a new chapter, including a description of the two families of 'mid-lines' between two given lines and an elementary derivation of the basic formulae of spherical trigonometry and hyperbolic trigonometry, and other new material.

The Encyclopedia Americana-Frederick Converse Beach 1905

An Introduction to Finite Projective Planes-Abraham Adrian Albert 2015-02-18 Text for both beginning and advanced undergraduate and graduate students covers finite planes, field planes, coordinates in an arbitrary plane, central collineations and the little Desargues' property, the fundamental theorem, and non-Desarguesian planes. 1968 edition.

History of Modern Mathematics-David Eugene Smith 1896

College Geometry-David C. Kay 2011-06-24 Designed for mathematics majors and other students who intend to teach mathematics at the secondary school level, College Geometry: A Unified Development unifies the three classical geometries within an axiomatic framework. The author develops the axioms to include Euclidean, elliptic, and hyperbolic geometry, showing how geometry has real and far-reaching implications. He approaches every topic as a fresh, new concept and carefully defines and explains geometric principles. The book begins with elementary ideas about points, lines, and distance, gradually introducing more advanced concepts such as congruent triangles and geometric inequalities. At the core of the text, the author simultaneously develops the classical formulas for spherical and hyperbolic geometry within the axiomatic framework. He explains how the trigonometry of the right triangle, including the Pythagorean theorem, is developed for classical non-Euclidean geometries. Previously accessible only to advanced or graduate students, this material is presented at an elementary level. The book also explores other important concepts of modern geometry, including affine transformations and circular inversion. Through clear explanations and numerous examples and problems, this text shows step-by-step how fundamental geometric ideas are connected to advanced geometry. It represents the first step toward future study of Riemannian geometry, Einstein’s relativity, and theories of cosmology.

Perspectives on Projective Geometry-Jürgen Richter-Gebert 2011-02-04 Projective geometry is one of the most fundamental and at the same time most beautiful branches of geometry. It can be considered the common foundation of many other geometric disciplines like Euclidean geometry, hyperbolic and elliptic geometry or even relativistic space-time geometry. This book offers a comprehensive introduction to this fascinating field and its applications. In particular, it explains how metric concepts may be best understood in projective terms. One of the major themes that appears throughout this book is the beauty of the interplay between geometry, algebra and combinatorics. This book can especially be used as a guide that explains how geometric objects and operations may be most elegantly expressed in algebraic terms, making it a valuable resource for mathematicians, as well as for computer scientists and physicists. The book is based on the author’s experience in implementing geometric software and includes hundreds of high-quality illustrations.

College Geometry-Howard Whitley Eves 1995 College Geometry is divided into two parts. Part I is a sequel to basic high school geometry and introduces the reader to some of the important modern extensions of elementary geometry-extension that have largely entered into the mainstream of mathematics. Part II treats notions of geometric structure that arose with the non-Euclidean revolution in the first half of the nineteenth century.

Euclid and His Modern Rivals-Charles Lutwidge Dodgson 2020-12-08 "Euclid and His Modern Rivals" by Charles Lutwidge Dodgson. Published by Good Press. Good Press publishes a wide range of titles that encompasses every genre. From well-known classics & literary fiction and non-fiction to forgotten−or yet undiscovered gems−of world literature, we issue the books that need to be read. Each Good Press edition has been meticulously edited and formatted to boost readability for all e-readers and devices. Our goal is to produce eBooks that are user-friendly and accessible to everyone in a high-quality digital format.

The Universe of Conics-Georg Glaeser 2016-03-22 This text presents the classical theory of conics in a modern form. It includes many novel results that are not easily accessible elsewhere. The approach combines synthetic and analytic methods to derive projective, affine and metrical properties, covering both Euclidean and non-Euclidean geometries. With more than two thousand years of history, conic sections play a fundamental role in numerous fields of mathematics and physics, with applications to mechanical engineering, architecture, astronomy, design and computer graphics. This text will be invaluable to undergraduate mathematics students, those in adjacent fields of study, and anyone with an interest in classical geometry. Augmented with more than three hundred fifty figures and photographs, this innovative text will enhance your understanding of projective geometry, linear algebra, mechanics, and differential geometry, with careful exposition and many illustrative exercises.

Geometry and Topology-Miles Reid 2005-11-10 Geometry provides a whole range of views on the universe, serving as the inspiration, technical toolkit and ultimate goal for many branches of mathematics and physics. This book introduces the ideas of geometry, and includes a generous supply of simple explanations and examples. The treatment emphasises coordinate systems and the coordinate changes that generate symmetries. The discussion moves from Euclidean to non-Euclidean geometries, including spherical and hyperbolic geometry, and then on to affine and projective linear geometries. Group theory is introduced to treat geometric symmetries, leading to the unification of geometry and group theory in the Erlangen program. An introduction to basic topology follows, with the Möbius strip, the Klein bottle and the surface with g handles exemplifying quotient topologies and the homeomorphism problem. Topology combines with group theory to yield the geometry of transformation groups,having applications to relativity theory and quantum mechanics. A final chapter features historical discussions and indications for further reading. With minimal prerequisites, the book provides a first glimpse of many research topics in modern algebra, geometry and theoretical physics. The book is based on many years' teaching experience, and is thoroughly class-tested. There are copious illustrations, and each chapter ends with a wide supply of exercises. Further teaching material is available for teachers via the web, including assignable problem sheets with solutions.

Geometry: Euclid and Beyond-Robin Hartshorne 2013-11-11 This book offers a unique opportunity to understand the essence of one of the great thinkers of western civilization. A guided reading of Euclid's Elements leads to a critical discussion and rigorous modern treatment of Euclid's geometry and its more recent descendants, with complete proofs. Topics include the introduction of coordinates, the theory of area, history of the parallel postulate, the various non-Euclidean geometries, and the regular and semi-regular polyhedra.