

Hartshorne S Algebraic Geometry Section 2 1 2 1 1

Complex GeometryElementary Algebraic GeometryAlgebraic GeometryBirational Geometry of Algebraic VarietiesDeformation TheoryAlgebraic GeometryAlgebraic GeometryCommutative AlgebraAn Introduction to Homological Algebra3264 and All ThatFoundations of Projective GeometryIntroduction To Commutative AlgebraAlgebraic GeometryUndergraduate Algebraic GeometryLectures on Logarithmic Algebraic GeometryAlgebraic GeometryThe Geometry of SchemesAlgebraic Geometry 2An Invitation to Algebraic GeometryTopology and GeometryFoundations of Algebraic GeometryBasic Algebraic Geometry 1Algebraic Geometry IAlgebraic GeometryReal and Functional AnalysisAlgebraic Geometry IAlgebraic and Analytic GeometryAlgebraic Geometry and Arithmetic CurvesAlgebraic GeometryRational Points on VarietiesAmple Subvarieties of Algebraic VarietiesMirror Symmetry and Algebraic GeometryIntroduction to Algebraic GeometryResidues and DualityAlgebraic GeometryCompanion to EuclidA Royal Road to Algebraic GeometryGeometry: Euclid and BeyondEnumerative Geometry and String TheoryAlgebraic Geometry I: Schemes

Complex Geometry

Grothendieck's beautiful theory of schemes permeates modern algebraic geometry and underlies its applications to number theory, physics, and applied mathematics. This simple account of that theory emphasizes and explains the universal geometric concepts behind the definitions. In the book, concepts are illustrated with fundamental examples, and explicit calculations show how the constructions of scheme theory are carried out in practice.

Elementary Algebraic Geometry

Mathematicians wanting to get into the field will find a very well written and encyclopaedic account of the mathematics which was needed in, and was developed from, what now might be termed classical mirror symmetry. --Bulletin of the LMS The book is highly recommended for everyone who wants to learn about the fascinating recent interplay between physics and mathematics. --Mathematical Reviews Mirror symmetry began when theoretical physicists made some astonishing predictions about rational curves on quintic hypersurfaces in four-dimensional projective space. Understanding the mathematics behind these predictions has been a substantial challenge. This book is a completely comprehensive monograph on mirror symmetry, covering the original observations by the physicists through the most recent progress made to date. Subjects discussed include toric varieties, Hodge theory, Kahler geometry, moduli of stable maps, Calabi-Yau manifolds, quantum cohomology, Gromov-Witten invariants, and the mirror theorem.

Algebraic Geometry

First Published in 2018. Routledge is an imprint of Taylor & Francis, an Informa

company.

Birational Geometry of Algebraic Varieties

From the reviews: "Although several textbooks on modern algebraic geometry have been published in the meantime, Mumford's "Volume I" is, together with its predecessor the red book of varieties and schemes, now as before one of the most excellent and profound primers of modern algebraic geometry. Both books are just true classics!" Zentralblatt

Deformation Theory

This book introduces the reader to modern algebraic geometry. It presents Grothendieck's technically demanding language of schemes that is the basis of the most important developments in the last fifty years within this area. A systematic treatment and motivation of the theory is emphasized, using concrete examples to illustrate its usefulness. Several examples from the realm of Hilbert modular surfaces and of determinantal varieties are used methodically to discuss the covered techniques. Thus the reader experiences that the further development of the theory yields an ever better understanding of these fascinating objects. The text is complemented by many exercises that serve to check the comprehension of the text, treat further examples, or give an outlook on further results. The volume at hand is an introduction to schemes. To get started, it requires only basic knowledge in abstract algebra and topology. Essential facts from commutative algebra are assembled in an appendix. It will be complemented by a second volume on the cohomology of schemes.

Algebraic Geometry

This graduate textbook offers a self-contained introduction to the concepts and techniques of logarithmic geometry, a key tool for analyzing compactification and degeneration in algebraic geometry and number theory. It features a systematic exposition of the foundations of the field, from the basic results on convex geometry and commutative monoids to the theory of logarithmic schemes and their de Rham and Betti cohomology. The book will be of use to graduate students and researchers working in algebraic, analytic, and arithmetic geometry as well as related fields.

Algebraic Geometry

The first geometrical properties of a projective nature were discovered in the third century by Pappus of Alexandria. Filippo Brunelleschi (1404-1472) started investigating the geometry of perspective in 1425. Johannes Kepler (1571-1630) and Gerard Desargues (1591-1661) independently developed the pivotal concept of the "point at infinity." Desargues developed an alternative way of constructing perspective drawings by generalizing the use of vanishing points to include the case when these are infinitely far away. He made Euclidean geometry, where parallel lines are truly parallel, into a special case of an all-encompassing geometric system. Desargues's study on conic sections drew the attention of

16-years old Blaise Pascal and helped him formulate Pascal's theorem. The works of Gaspard Monge at the end of 18th and beginning of 19th century were important for the subsequent development of projective geometry. The work of Desargues was ignored until Michel Chasles chanced upon a handwritten copy in 1845. Meanwhile, Jean-Victor Poncelet had published the foundational treatise on projective geometry in 1822. Poncelet separated the projective properties of objects in individual class and establishing a relationship between metric and projective properties. The non-Euclidean geometries discovered shortly thereafter were eventually demonstrated to have models, such as the Klein model of hyperbolic space, relating to projective geometry.

Commutative Algebra

The aim of this book is to introduce the reader to the geometric theory of algebraic varieties, in particular to the birational geometry of algebraic varieties. This volume grew out of the author's book in Japanese published in 3 volumes by Iwanami, Tokyo, in 1977. While writing this English version, the author has tried to rearrange and rewrite the original material so that even beginners can read it easily without referring to other books, such as textbooks on commutative algebra. The reader is only expected to know the definition of Noetherian rings and the statement of the Hilbert basis theorem. The new chapters 1, 2, and 10 have been expanded. In particular, the exposition of D-dimension theory, although shorter, is more complete than in the old version. However, to keep the book of manageable size, the latter parts of Chapters 6, 9, and 11 have been removed. I thank Mr. A. Sevenster for encouraging me to write this new version, and Professors K. K. Kubota in Kentucky and P. M. H. Wilson in Cambridge for their careful and critical reading of the English manuscripts and typescripts. I held seminars based on the material in this book at The University of Tokyo, where a large number of valuable comments and suggestions were given by students Iwamiya, Kawamata, Norimatsu, Tobita, Tsushima, Maeda, Sakamoto, Tsunoda, Chou, Fujiwara, Suzuki, and Matsuda.

An Introduction to Homological Algebra

The landscape of homological algebra has evolved over the last half-century into a fundamental tool for the working mathematician. This book provides a unified account of homological algebra as it exists today. The historical connection with topology, regular local rings, and semi-simple Lie algebras are also described. This book is suitable for second or third year graduate students. The first half of the book takes as its subject the canonical topics in homological algebra: derived functors, Tor and Ext, projective dimensions and spectral sequences. Homology of group and Lie algebras illustrate these topics. Intermingled are less canonical topics, such as the derived inverse limit functor \lim^1 , local cohomology, Galois cohomology, and affine Lie algebras. The last part of the book covers less traditional topics that are a vital part of the modern homological toolkit: simplicial methods, Hochschild and cyclic homology, derived categories and total derived functors. By making these tools more accessible, the book helps to break down the technological barrier between experts and casual users of homological algebra.

3264 and All That

This book is about modern algebraic geometry. The title *A Royal Road to Algebraic Geometry* is inspired by the famous anecdote about the king asking Euclid if there really existed no simpler way for learning geometry, than to read all of his work *Elements*. Euclid is said to have answered: "There is no royal road to geometry!" The book starts by explaining this enigmatic answer, the aim of the book being to argue that indeed, in some sense there is a royal road to algebraic geometry. From a point of departure in algebraic curves, the exposition moves on to the present shape of the field, culminating with Alexander Grothendieck's theory of schemes. Contemporary homological tools are explained. The reader will follow a directed path leading up to the main elements of modern algebraic geometry. When the road is completed, the reader is empowered to start navigating in this immense field, and to open up the door to a wonderful field of research. The greatest scientific experience of a lifetime!

Foundations of Projective Geometry

"This book succeeds brilliantly by concentrating on a number of core topics and by treating them in a hugely rich and varied way. The author ensures that the reader will learn a large amount of classical material and perhaps more importantly, will also learn that there is no one approach to the subject. The essence lies in the range and interplay of possible approaches. The author is to be congratulated on a work of deep and enthusiastic scholarship." --MATHEMATICAL REVIEWS

Introduction To Commutative Algebra

Aimed primarily at graduate students and beginning researchers, this book provides an introduction to algebraic geometry that is particularly suitable for those with no previous contact with the subject; it assumes only the standard background of undergraduate algebra. The book starts with easily-formulated problems with non-trivial solutions and uses these problems to introduce the fundamental tools of modern algebraic geometry: dimension; singularities; sheaves; varieties; and cohomology. A range of exercises is provided for each topic discussed, and a selection of problems and exam papers are collected in an appendix to provide material for further study.

Algebraic Geometry

Modern introduction to algebraic geometry for undergraduates; uses analytic ideas to access algebraic theory.

Undergraduate Algebraic Geometry

An introduction to abstract algebraic geometry, with the only prerequisites being results from commutative algebra, which are stated as needed, and some elementary topology. More than 400 exercises distributed throughout the book offer specific examples as well as more specialised topics not treated in the main text, while three appendices present brief accounts of some areas of current

research. This book can thus be used as textbook for an introductory course in algebraic geometry following a basic graduate course in algebra. Robin Hartshorne studied algebraic geometry with Oscar Zariski and David Mumford at Harvard, and with J.-P. Serre and A. Grothendieck in Paris. He is the author of "Residues and Duality", "Foundations of Projective Geometry", "Ample Subvarieties of Algebraic Varieties", and numerous research titles.

Lectures on Logarithmic Algebraic Geometry

This book can form the basis of a second course in algebraic geometry. As motivation, it takes concrete questions from enumerative geometry and intersection theory, and provides intuition and technique, so that the student develops the ability to solve geometric problems. The authors explain key ideas, including rational equivalence, Chow rings, Schubert calculus and Chern classes, and readers will appreciate the abundant examples, many provided as exercises with solutions available online. Intersection is concerned with the enumeration of solutions of systems of polynomial equations in several variables. It has been an active area of mathematics since the work of Leibniz. Chasles' nineteenth-century calculation that there are 3264 smooth conic plane curves tangent to five given general conics was an important landmark, and was the inspiration behind the title of this book. Such computations were motivation for Poincaré's development of topology, and for many subsequent theories, so that intersection theory is now a central topic of modern mathematics.

Algebraic Geometry

Easily accessible Includes recent developments Assumes very little knowledge of differentiable manifolds and functional analysis Particular emphasis on topics related to mirror symmetry (SUSY, Kaehler-Einstein metrics, Tian-Todorov lemma)

The Geometry of Schemes

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

Algebraic Geometry 2

An Invitation to Algebraic Geometry

This book is motivated by the problem of determining the set of rational points on a variety, but its true goal is to equip readers with a broad range of tools essential for current research in algebraic geometry and number theory. The book is unconventional in that it provides concise accounts of many topics instead of a

comprehensive account of just one—this is intentionally designed to bring readers up to speed rapidly. Among the topics included are Brauer groups, faithfully flat descent, algebraic groups, torsors, étale and fppf cohomology, the Weil conjectures, and the Brauer-Manin and descent obstructions. A final chapter applies all these to study the arithmetic of surfaces. The down-to-earth explanations and the over 100 exercises make the book suitable for use as a graduate-level textbook, but even experts will appreciate having a single source covering many aspects of geometry over an unrestricted ground field and containing some material that cannot be found elsewhere.

Topology and Geometry

Foundations of Algebraic Geometry

This book is a revised and expanded new edition of the first four chapters of Shafarevich's well-known introductory book on algebraic geometry. Besides correcting misprints and inaccuracies, the author has added plenty of new material, mostly concrete geometrical material such as Grassmannian varieties, plane cubic curves, the cubic surface, degenerations of quadrics and elliptic curves, the Bertini theorems, and normal surface singularities.

Basic Algebraic Geometry 1

Algebraic Geometry has been at the center of much of mathematics for hundreds of years. It is not an easy field to break into, despite its humble beginnings in the study of circles, ellipses, hyperbolas, and parabolas. This text consists of a series of ex

Algebraic Geometry I

This book is a general introduction to the theory of schemes, followed by applications to arithmetic surfaces and to the theory of reduction of algebraic curves. The first part introduces basic objects such as schemes, morphisms, base change, local properties (normality, regularity, Zariski's Main Theorem). This is followed by the more global aspect: coherent sheaves and a finiteness theorem for their cohomology groups. Then follows a chapter on sheaves of differentials, dualizing sheaves, and Grothendieck's duality theory. The first part ends with the theorem of Riemann-Roch and its application to the study of smooth projective curves over a field. Singular curves are treated through a detailed study of the Picard group. The second part starts with blowing-ups and desingularisation (embedded or not) of fibered surfaces over a Dedekind ring that leads on to intersection theory on arithmetic surfaces. Castelnuovo's criterion is proved and also the existence of the minimal regular model. This leads to the study of reduction of algebraic curves. The case of elliptic curves is studied in detail. The book concludes with the fundamental theorem of stable reduction of Deligne-Mumford. The book is essentially self-contained, including the necessary material on commutative algebra. The prerequisites are therefore few, and the book should suit a graduate student. It contains many examples and nearly 600 exercises.

Algebraic Geometry

This book introduces the reader to modern algebraic geometry. It presents Grothendieck's technically demanding language of schemes that is the basis of the most important developments in the last fifty years within this area. A systematic treatment and motivation of the theory is emphasized, using concrete examples to illustrate its usefulness. Several examples from the realm of Hilbert modular surfaces and of determinantal varieties are used methodically to discuss the covered techniques. Thus the reader experiences that the further development of the theory yields an ever better understanding of these fascinating objects. The text is complemented by many exercises that serve to check the comprehension of the text, treat further examples, or give an outlook on further results. The volume at hand is an introduction to schemes. To get started, it requires only basic knowledge in abstract algebra and topology. Essential facts from commutative algebra are assembled in an appendix. It will be complemented by a second volume on the cohomology of schemes.

Real and Functional Analysis

This short and readable introduction to algebraic geometry will be ideal for all undergraduate mathematicians coming to the subject for the first time.

Algebraic Geometry I

This book presents a readable and accessible introductory course in algebraic geometry, with most of the fundamental classical results presented with complete proofs. An emphasis is placed on developing connections between geometric and algebraic aspects of the theory. Differences between the theory in characteristic and positive characteristic are emphasized. The basic tools of classical and modern algebraic geometry are introduced, including varieties, schemes, singularities, sheaves, sheaf cohomology, and intersection theory. Basic classical results on curves and surfaces are proved. More advanced topics such as ramification theory, Zariski's main theorem, and Bertini's theorems for general linear systems are presented, with proofs, in the final chapters. With more than 200 exercises, the book is an excellent resource for teaching and learning introductory algebraic geometry.

Algebraic and Analytic Geometry

This book is meant as a text for a first-year graduate course in analysis. In a sense, it covers the same topics as elementary calculus but treats them in a manner suitable for people who will be using it in further mathematical investigations. The organization avoids long chains of logical interdependence, so that chapters are mostly independent. This allows a course to omit material from some chapters without compromising the exposition of material from later chapters.

Algebraic Geometry and Arithmetic Curves

This is a description of the underlying principles of algebraic geometry, some of its

important developments in the twentieth century, and some of the problems that occupy its practitioners today. It is intended for the working or the aspiring mathematician who is unfamiliar with algebraic geometry but wishes to gain an appreciation of its foundations and its goals with a minimum of prerequisites. Few algebraic prerequisites are presumed beyond a basic course in linear algebra.

Algebraic Geometry

Rational Points on Varieties

An introduction to abstract algebraic geometry, with the only prerequisites being results from commutative algebra, which are stated as needed, and some elementary topology. More than 400 exercises distributed throughout the book offer specific examples as well as more specialised topics not treated in the main text, while three appendices present brief accounts of some areas of current research. This book can thus be used as textbook for an introductory course in algebraic geometry following a basic graduate course in algebra. Robin Hartshorne studied algebraic geometry with Oscar Zariski and David Mumford at Harvard, and with J.-P. Serre and A. Grothendieck in Paris. He is the author of "Residues and Duality", "Foundations of Projective Geometry", "Ample Subvarieties of Algebraic Varieties", and numerous research titles.

Ample Subvarieties of Algebraic Varieties

This is a comprehensive review of commutative algebra, from localization and primary decomposition through dimension theory, homological methods, free resolutions and duality, emphasizing the origins of the ideas and their connections with other parts of mathematics. The book gives a concise treatment of Grobner basis theory and the constructive methods in commutative algebra and algebraic geometry that flow from it. Many exercises included.

Mirror Symmetry and Algebraic Geometry

Perhaps the most famous example of how ideas from modern physics have revolutionized mathematics is the way string theory has led to an overhaul of enumerative geometry, an area of mathematics that started in the eighteenth century. Century-old problems of enumerating geometric configurations have now been solved using new and deep mathematical techniques inspired by physics! The book begins with an insightful introduction to enumerative geometry. From there, the goal becomes explaining the more advanced elements of enumerative algebraic geometry. Along the way, there are some crash courses on intermediate topics which are essential tools for the student of modern mathematics, such as cohomology and other topics in geometry. The physics content assumes nothing beyond a first undergraduate course. The focus is on explaining the action principle in physics, the idea of string theory, and how these directly lead to questions in geometry. Once these topics are in place, the connection between physics and enumerative geometry is made with the introduction of topological quantum field theory and quantum cohomology.

Introduction to Algebraic Geometry

One of the major discoveries of the past two decades in algebraic geometry is the realization that the theory of minimal models of surfaces can be generalized to higher dimensional varieties. This generalization, called the minimal model program, or Mori's program, has developed into a powerful tool with applications to diverse questions in algebraic geometry and beyond. This book provides the first comprehensive introduction to the circle of ideas developed around the program, the prerequisites being only a basic knowledge of algebraic geometry. It will be of great interest to graduate students and researchers working in algebraic geometry and related fields.

Residues and Duality

This book is a true introduction to the basic concepts and techniques of algebraic geometry. The language is purposefully kept on an elementary level, avoiding sheaf theory and cohomology theory. The introduction of new algebraic concepts is always motivated by a discussion of the corresponding geometric ideas. The main point of the book is to illustrate the interplay between abstract theory and specific examples. The book contains numerous problems that illustrate the general theory. The text is suitable for advanced undergraduates and beginning graduate students. It contains sufficient material for a one-semester course. The reader should be familiar with the basic concepts of modern algebra. A course in one complex variable would be helpful, but is not necessary.

Algebraic Geometry

The basic problem of deformation theory in algebraic geometry involves watching a small deformation of one member of a family of objects, such as varieties, or subschemes in a fixed space, or vector bundles on a fixed scheme. In this new book, Robin Hartshorne studies first what happens over small infinitesimal deformations, and then gradually builds up to more global situations, using methods pioneered by Kodaira and Spencer in the complex analytic case, and adapted and expanded in algebraic geometry by Grothendieck. The author includes numerous exercises, as well as important examples illustrating various aspects of the theory. This text is based on a graduate course taught by the author at the University of California, Berkeley.

Companion to Euclid

This book offers an introductory course in algebraic topology. Starting with general topology, it discusses differentiable manifolds, cohomology, products and duality, the fundamental group, homology theory, and homotopy theory. From the reviews: "An interesting and original graduate text in topology and geometry a good lecturer can use this text to create a fine course. A beginning graduate student can use this text to learn a great deal of mathematics."—MATHEMATICAL REVIEWS

A Royal Road to Algebraic Geometry

Modern algebraic geometry is built upon two fundamental notions: schemes and sheaves. The theory of schemes is presented in the first part of this book (Algebraic Geometry 1: From Algebraic Varieties to Schemes, AMS, 1999, Translations of Mathematical Monographs, Volume 185). In the present book, the author turns to the theory of sheaves and their cohomology. Loosely speaking, a sheaf is a way of keeping track of local information defined on a topological space, such as the local algebraic functions on an algebraic manifold or the local sections of a vector bundle. Sheaf cohomology is a primary tool in understanding sheaves and using them to study properties of the corresponding manifolds. The text covers the important topics of the theory of sheaves on algebraic varieties, including types of sheaves and the fundamental operations on them, such as coherent and quasicoherent sheaves, direct and inverse images, behavior of sheaves under proper and projective morphisms, and Čech cohomology. The book contains numerous problems and exercises with solutions. It would be an excellent text for the second part of a course in algebraic geometry.

Geometry: Euclid and Beyond

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.

Enumerative Geometry and String Theory

" To sum up, this book helps to learn algebraic geometry in a short time, its concrete style is enjoyable for students and reveals the beauty of mathematics."
--Acta Scientiarum Mathematicarum

Algebraic Geometry I: Schemes

[ROMANCE](#) [ACTION & ADVENTURE](#) [MYSTERY & THRILLER](#) [BIOGRAPHIES & HISTORY](#) [CHILDREN'S](#) [YOUNG ADULT](#) [FANTASY](#) [HISTORICAL FICTION](#) [HORROR](#) [LITERARY FICTION](#) [NON-FICTION](#) [SCIENCE FICTION](#)