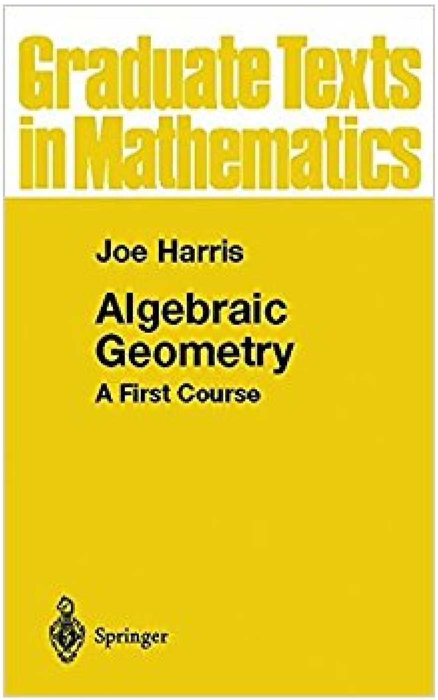
Ebook Directory
the best source of ebook

The book was found

Algebraic Geometry: A First Course (Graduate Texts In Mathematics) (v. 133)



PDF
Adobe
DOWNLOAD EBOOK

Synopsis

"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

Book Information

Series: Graduate Texts in Mathematics (Book 133)
Hardcover: 330 pages
Publisher: Springer; Corrected edition (December 1, 1995)
Language: English
ISBN-10: 0387977163
ISBN-13: 978-0387977164
Product Dimensions: 6.1 x 0.9 x 9.2 inches
Shipping Weight: 1.5 pounds (View shipping rates and policies)
Average Customer Review: 3.3 out of 5 stars 6 customer reviews
Best Sellers Rank: #637,181 in Books (See Top 100 in Books) #105 inÃ Â Books > Science & Math > Mathematics > Geometry & Topology > Algebraic Geometry #379 inÃ Â Books > Textbooks > Science & Mathematics > Mathematics > Geometry

Customer Reviews

J. Harris Algebraic Geometry A First Course "This book succeeds brilliantly by concentrating on a number of core topics (the rational normal curve, Veronese and Segre maps, quadrics, projections, Grassmannians, scrolls, Fano varieties, etc.) 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."Ã¢â ¬â ¢MATHEMATICAL REVIEWS

Actually, this is a very nice book. However, at least the way that I learn mathematics, it is not very good for a first course, as it is advertised to be. Rather it is a very nice compendium of examples after one has already had a first course in Algebraic Geometry.

If one is planning to do work in coding theory, cryptography, computer graphics, digitial watermarking, or are hoping to become a mathematician specializing in algebraic geometry, this book will be of an enormous help. The author does a first class job in introducing the reader to the field of algebraic geometry, using a wealth of examples and with the goal of building intuition and understanding. It is great that a mathematician of the author's caliber would take the time to write these lectures here put into book form. It is rare to find a book on algebraic geometry that attempts to make the subject concrete and understandable, and yet points the way to more modern "scheme-theoretic" formulations. In lecture 1, the author introduces affine and projective varieties over algebraically closed fields. Linear subspaces of n-dimensional projective space P(n) are shown to be varieties, along with any finite subset of P(n). He delays giving rigorous definitions of degree and dimension, emphasizing instead concrete examples of varieties. The twisted cubic is given as the first example of a concrete variety that is not a hypersurface, along with their generalizations, the rational normal curves. The Zariski topology, considered by the newcomer to the subject as being a rather "strange" topology, is introduced in lecture 2. The author does a great job though explaining its properties, and introduces the regular functions on affine and projective varieties. The Nullstellensatz theorem, needed to prove that the ring of regular functions is the coordinate ring, is deferred to a later lecture. Rational normal curves are further generalized to Veronese maps in this lecture, and the properties of the corresponding Veronese varieties discussed in some detail. Also, the very interesting Segre varieties are discussed here. With these two examples of varieties, the reader already can develop a good geometric intution of the behavior of typical varieties. The Veronese and Segre maps are then combined to give another example of a variety: the rational normal scroll. More concrete examples of varieties are given in the next two lectures, including cones, quadrics, and projections. A "fiber bundle" approach to forming families of varieties parametrized by a given variety is outlined here also. The author finally gets down to more algebraic matters in lecture 5, with the Nullstellensatz proven in great detail. He also discusses the origins of schemes in algebraic geometry, giving the reader a better appreciation of just where these objects arise, namely the association to an arbitrary ideal, instead of merely a radical ideal. Grassmannian varieties are then introduced in lecture 6, along with some of its subvarieties, such as the Fano varieties. The join operation, widely used in geometric topology, is here defined for two varieties. More connections with the modern viewpoint are made in lecture 7, where rational functions and rational maps are discussed. The author takes great care in explaining in what sense rational maps can be thought of as maps in the "ordinary" sense, namely they must be thought of as equivalence classes of pairs, instead of acting on points. The very important concept of a birational isomorphism is discussed also, along with blow-ups and blow-downs of varieties. Many more concrete examples of varieties are given in lectures 8 and 9, such as secant varieties, flag manifolds, and determinantal varieties. In addition, algebraic groups on varieties are discussed in lecture 10, allowing one to discuss a kind of glueing operation on varieties, just as in geometric topology, namely by taking the quotient of varieties via finite groups. The author then moves on to giving a more rigorous formulation of dimension, giving several different definitions, all of these conforming to intuitive ideas on what the dimension of an algebraic variety should be, and also one compatible with a purely algebraic context. Again, several concrete examples are given to illustrate the actual calculation of the dimension of a variety, both in this lecture and the next one. The next lecture is very interesting and discusses an important problem in algebraic geometry, namely the determination of how many hypersurfaces of each degree contain a projective variety in P(n). The solution is given in terms of the famous Hilbert polynomial, which is determined for rational normal curves, Veronese varieties, and plane curves in this lecture. The author also explains the utility of using graded modules in the determination of the Hilbert polynomial, something that is usually glossed over in most books on this topic. This discussion leads to the Hilbert syzygy theorem. Some analogs of basic contructions in differential geometry are defined for varieties in the next four lectures, based on an appropriate notion of smoothness. The tangent spaces, the Gauss map, and duals discussed here. Then in lecture 18 the author makes good on his promise in earlier lectures of making the notion of the degree of a projective variety more rigorous. The well-known Bezout's theorem is proven, after introducting a notion of transversal intersection for varieties. As usual in the book, several examples are given for the calculation of the degree, including Veronese and Segre varieties, in this lecture and the next. The behavior of a variety at a singular point is studied in lecture 20 using tangent cones. The author proves the resolution of singularities for curves here also. Lecture 21 is very important, especially for the physicist reader working in string and M-theories, as the author introduces the concept of a moduli space. Most results are left unproven, but the intuition gained from reading this lecture is invaluable. The all-important Chow and Hilbert varieties are discussed here. The book the ends with a fairly lengthy overview of quadric hypersurfaces.

Last year we used this title as a main reference for the first two quarters of a year-long introductory sequence on algebraic geometry, at the beginning graduate student level (2nd year). Our professor --who was himself a former student of Harris, and a specialist in the Mori program-- backed up the presentation with personal lecture notes, moving mostly in parallel to the book's topics. In the third quarter of the sequence, we moved up to cover the theory of sheaves and schemes from Robin

Hartshorne's advanced treatise. Prior to this point, my only exposure to the subject was from the corresponding chapter in Dummit and Foote's algebra, and also from a recent introductory text, "An Invitation to Algebraic Geometry" by Karen Smith et al. At this stage of my studies I was mainly testing the waters: My ineterest on one hand was driven by a curiosity for the subject itself, which has a reputation for being difficult and hard to grasp, and on the other hand from its pivotal role in the formulation of new physical theories of mirror symmetry and string theory (for more in this direction, see the 1999 AMS title by A. Cox and S. Katz).Back to the present text, as the editorial notes correctly point out, this Harris book emphasizes the classical algebraic geometry from the 19th & early 20th centuries prior to the introduction of highly abstract machinery, due to the work of A. Groethendieck in the 50's and 60's. Therefore it's quite natural to base the treatment mostly on the examples and concrete constructions, which were the guiding principles of the abstract development in the first place. This approach also makes the subject accessible for the newcomers who may not have an advanced background in commutative algebra or category theory, and who may not be intending to specialize in the area but merely wish to gain a general understanding of the ideas involved. I found my experience with the subject very fulfilling, and enjoyed many aspects of the presentation. I only suspect many of you could have a similar rewarding experience embarking upon this journey! For the application-oriented readers, I should recommend the Springer-Verlag title "Ideals, Varieties and Algorithms" by Cox et al. which has separate chapters on the Groebner bases, invariant theory, and the robotics.

If you were hoping, for some reason, that this book is any more appropriate for a first course as is his more well-known "first course" in representation theory, you're going to be disappointed. Would be very difficult, as a quick perusal of the table of contents - and how many pages each topic is allotted - would indicate to anybody at least vaguely familiar with varieties. Other books 'recommended' in comments are random. Hartshorne is standard for good reasons; your second-best option is to look for some lecture notes on affine and projective varieties, the basic study of which would comprise a big chunk of a first course in algebraic geometry, but which gets about 20 pages in this tome. My recommendation would be Hartshorne, maybe augmented with some other text just to get a second perspective, followed by Eisenbud's 'Geometry of Schemes'; this is a fairly doable path.

This book is not a good first text for a person trying to learn algebraic geometry. Prof. Harris gives very limited explanations and few clear examples. Try Shafarevich, Basic Algebraic Geometry vols I

& II or Miles Reid, Undergraduate Algebraic Geometry. For both books, you would need commutative algebra, at least at the level of Miles Reid, Undergraduate Commutative Algebra.

I was confused by the many examples. Most of the times I did not see how they fit together in the theory. Perhaps I would have appreciate it more, had I known some algebraic geometry first.

Download to continue reading...

Algebraic Geometry: A First Course (Graduate Texts in Mathematics) (v. 133) Commutative Algebra: with a View Toward Algebraic Geometry (Graduate Texts in Mathematics) Algebraic Geometry (Graduate Texts in Mathematics) The Big Book of Building: Everything MinecraftÃ Â®™ Imagine it… Create it… Build it Modern Geometry Ã¢â ¬â ¢ Methods and Applications: Part I: The Geometry of Surfaces, Transformation Groups, and Fields (Graduate Texts in Mathematics) (Pt. 1) Algebraic Graph Theory (Graduate Texts in Mathematics) Algebraic Topology: An Introduction (Graduate Texts in Mathematics) (v. 56) Ideals, Varieties, and Algorithms: An Introduction to Computational Algebraic Geometry and Commutative Algebra (Undergraduate Texts in Mathematics) Representation Theory: A First Course (Graduate Texts in Mathematics) Differential Geometry: Connections, Curvature, and Characteristic Classes (Graduate Texts in Mathematics) The Geometry of Schemes (Graduate Texts in Mathematics) Lectures on Discrete Geometry (Graduate Texts in Mathematics) Riemannian Holonomy Groups and Calibrated Geometry (Oxford Graduate Texts in Mathematics) Topology and Geometry (Graduate Texts in Mathematics) The Geometry of Discrete Groups (Graduate Texts in Mathematics) Undergraduate Algebraic Geometry (London Mathematical Society Student Texts) Algebraic Curves and Riemann Surfaces (Graduate Studies in Mathematics, Vol 5) A Course in the Theory of Groups (Graduate Texts in Mathematics, Vol. 80) A Course in Number Theory and Cryptography (Graduate Texts in Mathematics) Algebraic Geometry and Statistical Learning Theory (Cambridge Monographs on Applied and Computational Mathematics)