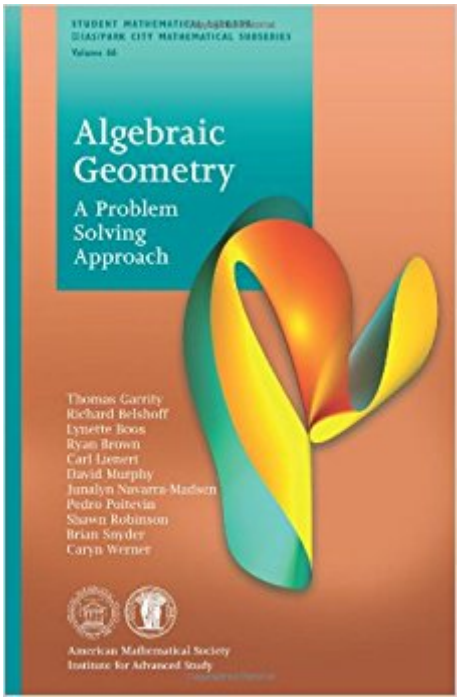
Algebraic Geometry: A Problem Solving Approach (Student Mathematical Library)



Synopsis

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 exercises, plus some background information and explanations, starting with conics and ending with sheaves and cohomology. The first chapter on conics is appropriate for first-year college students (and many high school students). Chapter 2 leads the reader to an understanding of the basics of cubic curves, while Chapter 3 introduces higher degree curves. Both chapters are appropriate for people who have taken multivariable calculus and linear algebra. Chapters 4 and 5 introduce geometric objects of higher dimension than curves. Abstract algebra now plays a critical role, making a first course in abstract algebra necessary from this point on. The last chapter is on sheaves and cohomology, providing a hint of current work in algebraic geometry.

Book Information

Series: Student Mathematical Library
Paperback: 335 pages
Publisher: American Mathematical Society in corporation with IAS/Park City Mathematics Institute; Student edition (February 14, 2013)
Language: English
ISBN-10: 0821893963
ISBN-13: 978-0821893968
Product Dimensions: 0.8 x 5.8 x 9 inches
Shipping Weight: 15.2 ounces (View shipping rates and policies)
Average Customer Review: 4.6 out of 5 stars 3 customer reviews
Best Sellers Rank: #536,531 in Books (See Top 100 in Books) #75 inÃ Â Books > Science & Math > Mathematics > Geometry & Topology > Algebraic Geometry #308 inÃ Â Books > Textbooks > Science & Mathematics > Mathematics > Geometry #1647 inÃ Â Books > Textbooks > Science & Mathematics > Mathematics > Algebra & Trigonometry

Customer Reviews

Over the last twenty-five years there have been many excellent books written on algebraic geometry -- off the top of my head, Kunz, Perrin, Gibson, Shafarevich, Brieskorn and Knorrer, Fischer, and Miranda come to mind. These books are pitched at various levels -- Gibson being the most elementary and Shafarevich, Perrin, and Miranda being pitched at a grad level. But none of these

books take one from an elementary level to things like Riemann-Roch, sheaves, and cohomology. As far as I know the book by Garrity et al is the first that does so. As such, it's ideal for an upper division undergrad course or as a supplementary text for a grad course.The book starts with establishing the equivalence of conics in the complex projective plane and then moves on smoothly to discussing tangents and singularities, elliptic curves, Bezout's theorem, Riemann-Roch, affine and projective varieties, and -- finally -- a brief intro to sheaves and cohomology. Motivation for generalisation is provided each step of the way -- no abstract axiomatic development here. After finishing the book, a student would be prepared to tackle Perrin, Shafarevich, or even Hartshorne.I admire the smooth and seamless way the authors move from topic to topic, building the subject from simple and intuitive beginnings to things like Riemann-Roch. It's difficult to find books that take one from the elementary and classical geometry of algebraic curves to modern algebraic geometry.The book develops mostly through problems -- but the problems aren't difficult, largely computational, and what I consider to be almost routine in character. Anyone who has completed an undergrad course in abstract algebra should have no problem.For these reasons I argue that the book is the best introduction to algebraic geometry currently on the market.

Textbook is expensive, but seems to be of very good quality. I like the fact that there are multiple authors for a mature and balanced viewpoint. Also, the book is well organized, with each chapter and section having a clear focus and necessary audience background. I do not love the fact that the exercises are mixed into the text, but this seems to have been fairly well-executed in this case.

Impressed by Thomas Garrity's "All the Mathematics You Missed....."I rushed to buy this book, but was very disappointed because all itconsisted of were exercises to be solved by myself. Well, my philosophy is that if all a book contains is exercises to be solved by me, then I can as well re-discover that field myself - no thanks to the book. In fact, I impulsively decided to write a very angry review of this book. But somehow I calmed down and threw the book aside. After about 9 months, when I thought I had become a little more "geometrically mature" by devoting some time to Differential Geometry, I picked up this book again, and then I found that it is in some sense a unique book in Algebraic Geometry - a field, in my opinion, notorious for Algebraic geometers trying to show off their pseudo-knowledge just by hiding the field's underlying geometric simplicity, especially from physicists like me.What I am noticing now is that this books gives a lot of missing logic and connections in this field by starting from "obviously simple" geometrical intuition of conics and cubics and ending with Sheaves and Cohomology. I personally would like to know of any other book which

tries this. This is the main worth of this book.But my initial anger has not died down completely for reasons:1) I expect more explanations and less exercises from a book written by eleven writers. Well, the eleven authors don't have to look further than the book of their own beloved and respected Garrity mentioned above to understand what I mean.2) I also expected that a "Gang of Eleven" will say about Algebraic Geometry what David Hestenes said about Geometric Algebra "Algebra without Geometry is Blind".PS: I have no intension of solving any exercise, because the connection between various ideas is more important for physicists like me than rigorous proofs of the exercises.Rattan MannRattan Mann Films,Oslo Norway.Second Opinion (Review) of this book after reading about 180 pages from cover to cover:After reading this book cover to cover for about 180 pages, I feel my initial intuition about the approach of this book was correct. In fact, now I feel that my initial intuition has some lessons for the prestigious Institute for Advanced Study, Princeton, which has sponsored this book.Around page 160 there begins the standard "student exercise" approach to Riemann-Roch Theorem. This reminds me of what a Norwegian professor of mathematics told me a long time ago with very great excitement in reference to Hartshorne's "Algebraic Geometry ".He basically said that in our great modern times full of great geniuses, Riemann's work has been reduced to half a page of footnote. At that time I was very impressed by his words because, as a physicist, I was struggling with abstract research level mathematics. But today, with hindsight, I find it a very silly statement, because it is now my opinion that if someone has not spent years thinking about Riemann's work, he does not know any mathematics at all.By reducing Riemann-Roch Theorem to a few "student exercises", this book is basically saying what this Norwegian professor of mathematicstold me a long time ago.What is more surprising and disappointing for me is that the great Institute For Advanced Study, Princeton, sponsors such silly views.Wake up, great teachers and gurus, and start thinking at least when you are in IAS.Rattan Mann,Rattan Mann Films,Oslo, Norway.

Periodontology and Implantology, 1e (Clinical Problem Solving in Dentistry) Undergraduate Algebraic Geometry (London Mathematical Society Student Texts) Topics in Algebraic and Analytic Geometry. (MN-13), Volume 13: Notes From a Course of Phillip Griffiths (Mathematical Notes) Algebraic Topology: An Intuitive Approach (Translations of Mathematical Monographs, Vol. 183) Algebraic Topology: A Student's Guide (London Mathematical Society Lecture Note Series) Puzzles, Paradoxes, and Problem Solving: An Introduction to Mathematical Thinking Mathematical Thinking: Problem-Solving and Proofs (Classic Version) (2nd Edition) (Pearson Modern Classics for Advanced Mathematics Series) Mathematical Thinking: Problem-Solving and Proofs (2nd Edition) HIGH SCHOOL MATH COMMON-CORE GEOMETRY PRACTICE/PROBLEM SOLVING WORKBOOK GRADE 9/10 Holt McDougal Geometry: Practice and Problem Solving Workbook Introduction to Geometry, 2nd Edition (The Art of Problem Solving) An Introduction to the Mathematical Theory of Waves (Student Mathematical Library, V. 3) Lectures on Fractal Geometry and Dynamical Systems (Student Mathematical Library) From Groups to Geometry and Back (Student Mathematical Library)