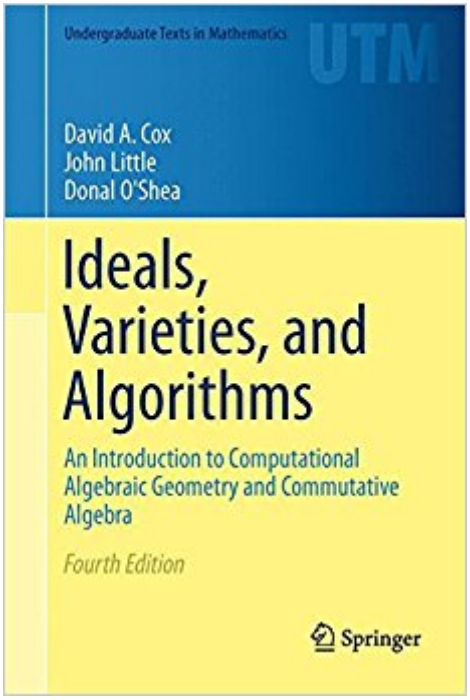
Ideals, Varieties, And Algorithms: An Introduction To Computational Algebraic Geometry And Commutative Algebra (Undergraduate Texts In Mathematics)



Synopsis

This text covers topics in algebraic geometry and commutative algebra with a strong perspective toward practical and computational aspects. The first four chapters form the core of the book. A comprehensive chart in the Preface illustrates a variety of ways to proceed with the material once these chapters are covered. In addition to the fundamentals of algebraic geometryâ •the elimination theorem, the extension theorem, the closure theorem and the Nullstellensatzâ •this new edition incorporates several substantial changes, all of which are listed in the Preface. The largest revision incorporates a new Chapter (ten), which presents some of the essentials of progress made over the last decades in computing GrÃ¶bner bases. The book also includes current computer algebra material in Appendix C and updated independent projects (Appendix D).The book may serve as a first or second course in undergraduate abstract algebra and with some supplementation perhaps, for beginning graduate level courses in algebraic geometry or computational algebra. Prerequisites for the reader include linear algebra and a proof-oriented course.Â It is assumed that the reader has access to a computer algebra system. Appendix C describes features of Mapleâ„¢, MathematicaÂ® and Sage, as well as other systems that are most relevant to the text. Pseudocode is used in the text; Appendix B carefully describes the pseudocode used.From the reviews of previous editions:Â â œâ |The book gives an introduction to Buchbergerâ ™s algorithm with applications to syzygies, Hilbert polynomials, primary decompositions. There is an introduction to classical algebraic geometry with applications to the ideal membership problem, solving polynomial equations and elimination theory. â |The book is well-written. â |The reviewer is sure that it will be an excellent guide to introduce further undergraduates in the algorithmic aspect of commutative algebra and algebraic geometry.â • Â â •Peter Schenzel, zbMATH, 2007Â â œI consider the book to be wonderful. ... The exposition is very clear, there are many helpful pictures and there are a great many instructive exercises, some quite challenging ... offers the heart and soul of modern commutative and algebraic geometry.â • Â â •The American Mathematical Monthly

Book Information

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Customer Reviews

â œIn each of the new editions the authors' were interested to incorporate new developments, simplifications of arguments as well as further applications. Thanks to the authors' this is also the case in the present fourth edition. â | Thanks to the continuously updating the textbook will remain an excellent source for the computational Commutative Algebra for students as well as for researchers interested in learning the subject.â • (Peter Schenzel, zbMATH 1335.13001, 2016)

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great book. I use it for introducting to abstract algebra.

Certainly will take you from a novice to a high level of understanding. If you are already a professional mathematician, you will need to skim parts (the authors repeat things a lot, which is a very useful pedagogical device, but can be annoying if you are reading the book sequentially.

Filled with great information about its subject (see title). Its my second copy. I ruined the first copy by working it so hard.

I guess the third edition is better. I don’t like the new version of proof of extension theorem and Hilbert Nullstellensatz theorem. Proofs in the third edition are more elegant (at least to me). However, this book is by far the best to introduce us the subject with minimal prerequisites. It would be great if you take a course with this book as the textbook.

Algebraic Geometry (Graduate Texts in Mathematics) Algebraic Geometry: A First Course (Graduate Texts in Mathematics) (v. 133) Geometry: A Metric Approach with Models (Undergraduate Texts in Mathematics) First Steps in Differential Geometry: Riemannian, Contact, Symplectic (Undergraduate Texts in Mathematics) Linear Algebra Done Right (Undergraduate Texts in Mathematics) Mathematics and Technology (Springer Undergraduate Texts in Mathematics and Technology) Discrete Mathematics: Elementary and Beyond (Undergraduate Texts in Mathematics) Proofs and Fundamentals: A First Course in Abstract Mathematics (Undergraduate Texts in Mathematics)