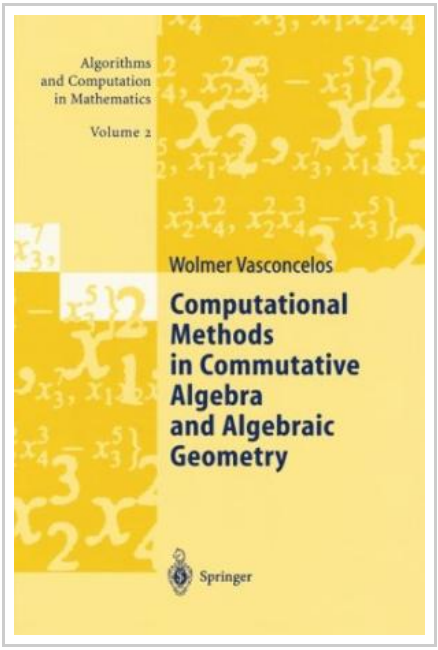

Computational Methods in Commutative Algebra and Algebraic Geometry

By Vasconcelos, Wolmer V. / Eisenbud, David

Book Condition: New. Publisher/Verlag: Springer, Berlin | This ACM volume in computational algebra deals with methods and techniques to tackle problems that can be represented by data structures which are essentially matrices with polynomial entries, mediated by the disciplines of commutative algebra and algebraic geometry. It relates discoveries by a growing, interdisciplinary, group of researchers in the past decade. It highlights the use of advanced techniques to bring down the cost of computation. The book includes concrete algorithms written in MACAULAY. It is intended for advanced students and researchers with interests both in algebra and computation. Many parts of it can be read by anyone with a basic abstract algebra course. | 1 Fundamental Algorithms.- 1.1 Gröbner Basics.- 1.2 Division Algorithms.- 1.3 Computation of Syzygies.- 1.4 Hilbert Functions.- 1.5 Computer Algebra Systems.- 2 Toolkit.- 2.1 Elimination Techniques.- 2.2 Rings of Endomorphisms.- 2.3 Noether Normalization.- 2.4 Fitting Ideals.- 2.5 Finite and Quasi-Finite Morphisms.- 2.6 Flat Morphisms.- 2.7 Cohen-Macaulay Algebras.- 3 Principles of Primary Decomposition.- 3.1 Associated Primes and Irreducible Decomposition.- 3.2 Equidimensional Decomposition of an Ideal.- 3.3 Equidimensional Decomposition Without Exts.- 3.4 Mixed Primary Decomposition.- 3.5 Elements of Factorizers.- 4 Computing in Artin Algebras.- 4.1 Structure of Artin Algebras.- 4.2 Zero-Dimensional...

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