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Nota di contenuto	Cover; Contents; Preface; Prologue: General Remarks on Computer Algebra Systems; 1 The Geometry-Algebra Dictionary; 1.1 Affine Algebraic Geometry; 1.1.1 Ideals in Polynomial Rings; 1.1.2 Affine Algebraic Sets; 1.1.3 Hilbert's Nullstellensatz; 1.1.4 Irreducible Algebraic Sets; 1.1.5 Removing Algebraic Sets; 1.1.6 Polynomial Maps; 1.1.7 The Geometry of Elimination; 1.1.8 Noether Normalization and Dimension; 1.1.9 Local Studies; 1.2 Projective Algebraic Geometry; 1.2.1 The Projective Space; 1.2.2 Projective Algebraic Sets; 1.2.3 Affine Charts and the Projective Closure 1.2.4 The Hilbert Polynomial 2 Computing; 2.1 Standard Bases and Singular; 2.2 Applications; 2.2.1 Ideal Membership; 2.2.2 Elimination; 2.2.3 Radical Membership; 2.2.4 Ideal Intersections; 2.2.5 Ideal Quotients; 2.2.6 Kernel of a Ring Map; 2.2.7 Integrality Criterion; 2.2.8 Noether Normalization; 2.2.9 Subalgebra Membership; 2.2.10 Homogenization; 2.3 Dimension and the Hilbert Function; 2.4 Primary

Decomposition and Radicals; 2.5 Buchberger's Algorithm and Field Extensions; 3 Sudoku; 4 A Problem in Group Theory Solved by Computer Algebra; 4.1 Finite Groups and Thompson's Theorem 4.2 Characterization of Finite Solvable GroupsBibliography; Index

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Sommario/riassunto

A First Course in Computational Algebraic Geometry is designed for young students with some background in algebra who wish to perform their first experiments in computational geometry. Originating from a course taught at the African Institute for Mathematical Sciences, the book gives a compact presentation of the basic theory, with particular emphasis on explicit computational examples using the freely available computer algebra system, Singular. Readers will quickly gain the confidence to begin performing their own experiments.

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