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Groups over Hilbertian Fields -- 19 Small Profinite Groups -- 20 Free Profinite Groups -- 21 The Haar Measure -- 22 Effective Field Theory and Algebraic Geometry -- 23 The Elementary Theory of -Free PAC Fields -- 24 Problems of Arithmetical Geometry -- 25 Projective Groups and Frattini Covers -- 26 PAC Fields and Projective Absolute Galois Groups -- 27 Frobenius Fields -- 28 Free Profinite Groups of Infinite Rank -- 29 Random Elements in Profinite Groups -- 30 Omega-free PAC Fields -- 31 Hilbertian Subfields of Galois Extensions -- 32 Undecidability -- 33 Algebraically Closed Fields with Distinguished Automorphisms -- 34 Galois Stratification -- 35 Galois Stratification over Finite Fields -- 36 Problems of Field Arithmetic.

Sommario/riassunto

This book uses algebraic tools to study the elementary properties of classes of fields and related algorithmic problems. The first part covers foundational material on infinite Galois theory, profinite groups, algebraic function fields in one variable and plane curves. It provides complete and elementary proofs of the Chebotarev density theorem and the Riemann hypothesis for function fields, together with material on ultraproducts, decision procedures, the elementary theory of algebraically closed fields, undecidability and nonstandard model theory, including a nonstandard proof of Hilbert's irreducibility theorem. The focus then turns to the study of pseudo algebraically closed (PAC) fields, related structures and associated decidability and undecidability results. PAC fields (fields K with the property that every absolutely irreducible variety over K has a rational point) first arose in the elementary theory of finite fields and have deep connections with number theory. This fourth edition substantially extends, updates and clarifies the previous editions of this celebrated book, and includes a new chapter on Hilbertian subfields of Galois extensions. Almost every chapter concludes with a set of exercises and bibliographical notes. An appendix presents a selection of open research problems. Drawing from a wide literature at the interface of logic and arithmetic, this detailed and self-contained text can serve both as a textbook for graduate courses and as an invaluable reference for seasoned researchers.
