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## Computer Algebra Handbook

By Grabmeier, Johannes / Kaltofen, Erich

Book Condition: New. Publisher/Verlag: Springer, Berlin | Foundations Applications Systems | This Handbook gives a comprehensive snapshot of a field at the intersection of mathematics and computer science with applications in physics, engineering and education. Reviews 67 software systems and offers 100 pages on applications in physics, mathematics, computer science, engineering chemistry and education. | 1 Development, Characterization, Prospects.- 1.1 Historical Remarks.- 1.2 General Characterization.- 1.3 Impact on Education.- 1.4 Impact on Research.- 1.5 Computer Algebra - Today and Tomorrow.- 1.5.1 Today.- 1.5.2 Outlook.- 2 Topics of Computer Algebra.- 2.1 Exact Arithmetic.- 2.1.1 Long Integer Arithmetic.- 2.1.2 Arithmetic with Polynomials, Rational Functions and Power Series.- 2.1.3 Euclid's Algorithm and Continued Fractions.- 2.1.4 Modular Arithmetic and the Chinese Remainder Theorem.- 2.1.5 Computations with Algebraic Numbers.- 2.1.6 Real Algebraic Numbers.- 2.1.7 p-adic Numbers and Approximations.- 2.1.8 Finite Fields.- 2.2 Algorithms for Polynomials and Power Series.- 2.2.1 The Division Algorithm.- 2.2.2 Factorization of Polynomials.- 2.2.3 Absolute Factorization of Polynomials.- 2.2.4 Polynomial Decomposition.- 2.2.5 Gröbner Bases.- 2.2.6 Standard Bases.- 2.2.7 Characteristic Sets.- 2.2.8 Algorithmic Invariant Theory.- 2.3 Linear Algebra.- 2.3.1 Linear Systems.- 2.3.2 Algorithms for Matrix Canonical Forms.- 2.4 Constructive Methods of Number Theory.- 2.4.1 Primality Tests.- 2.4.2 Integer Factorization.- 2.4.3 Algebraic Number Fields and...



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