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Sommario/riassunto

This textbook on combinatorial commutative algebra focuses on properties of monomial ideals in polynomial rings and their connections with other areas of mathematics such as combinatorics, electrical engineering, topology, geometry, and homological algebra. Aimed toward advanced undergraduate students and graduate students who have taken a basic course in abstract algebra that includes polynomial rings and ideals, this book serves as a core text for a course in combinatorial commutative algebra or as preparation for more advanced courses in the area. The text contains over 600 exercises to provide readers with a hands-on experience working with the material; the exercises include computations of specific examples and proofs of general results. Readers will receive a firsthand introduction to the computer algebra system Macaulay2 with tutorials and exercises for most sections of the text, preparing them for significant computational work in the area. Connections to non-monomial areas of abstract algebra, electrical engineering, combinatorics and other areas of mathematics are provided which give the reader a sense of how these ideas reach into other areas. . .