

The Fundamental Theorem of Algebra

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Reviews

The publication is fantastic and great. It can be rally exciting through reading period of time. I am just very happy to inform you that this is the greatest publication i actually have read in my very own daily life and could be he very best ebook for at any time. (Prof. Alvis Wuckert)

THE FUNDAMENTAL THEOREM OF ALGEBRA



Book Condition: New. Publisher/Verlag: Springer, Berlin | The fundamental theorem of algebra states that any complex polynomial must have a complex root. This book examines three pairs of proofs of the theorem from three different areas of mathematics: abstract algebra, complex analysis and topology. The first proof in each pair is fairly straightforward and depends only on what could be considered elementary mathematics. However, each of these first proofs leads to more general results from which the fundamental theorem can be deduced as a direct consequence. These general results constitute the second proof in each pair. To arrive at each of the proofs, enough of the general theory of each relevant area is developed to understand the proof. In addition to the proofs and techniques themselves, many applications such as the insolvability of the quintic and the transcendence of e and pi are presented. Finally, a series of appendices give six additional proofs including a version of Gauss'original first proof. The book is intended for junior/senior level undergraduate mathematics students or first year graduate students, and would make an ideal "capstone" course in mathematics. | 1 Introduction and Historical Remarks.- 2 Complex Numbers.- 2.1 Fields and the Real Field.- 2.2 The Complex Number Field.- 2.3 Geometrical Representation of Complex Numbers.- 2.4 Polar Form and Euler's Identity.- 2.5 DeMoivre's Theorem for Powers and Roots.- Exercises.- 3 Polynomials and Complex Polynomials.- 3.1 The Ring of Polynomials over a Field.- 3.2 Divisibility and Unique Factorization of Polynomials.- 3.3 Roots of Polynomials and Factorization.- 3.4 Real and Complex Polynomials.- 3.5 The Fundamental Theorem of Algebra: Proof One.- 3.6 Some Consequences of the Fundamental Theorem.-Exercises.- 4 Complex Analysis and Analytic Functions.- 4.1 Complex Functions and Analyticity.- 4.2 The Cauchy-Riemann Equations.- 4.3 Conformal Mappings and Analyticity.- Exercises.- 5 Complex Integration and Cauchy's Theorem.- 5.1 Line...

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