

Inequalities in the analytic theory of polynomials

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Abstract

Polynomials are omnipresent in mathematics. The analytic theory of polynomials is the study of polynomials using techniques in analysis. Despite being over 220 years old, it is still an active area of research. We will look at some of the recent progress in this area in the 21st century such as the solution to the conjectures of Schoenberg and De Bruijn-Springer and the characterization of which quartic polynomials are the derivatives of hyperbolic polynomials. We will also look at two unsolved problems in this area: Sendov's conjecture and Mahler's conjecture.