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Inequalities in the Analytic Theory of Polynomials

We show how techniques in matrix theory and majorization can be used to derive inequalities relating the zeros and critical points of a polynomial. These inequalities strengthen known results such as the Gauss–Lucas Theorem and Mahler’s inequality. We will also present some partial results and conjectures on a Koo–Pritsker type inequality between the Bombieri norm of a polynomial and the product of the Bombieri norms of its linear factors.