

Lecture 1 - Graduate Talk

Two famous conjectures about the critical points of polynomials

We shall discuss two of the most challenging open problems in the analytic theory of polynomials, those of B. Sendov and S. Smale. Under some additional restrictions the conjectures can be verified by elementary methods.

Lecture 2 - Colloquium

Majorization of polynomials on the plane

We consider the problem of majorization of $|P(u)|$, for a fixed point u in the complex plane, over the set of all algebraic polynomials P of degree n which are bounded by 1 on $[-1, 1]$. The extremal polynomial was described by S. N. Bernstein in the case $|u| > 1$. We study the case when u is in the unit disk. The problem is related to the Markov inequality.

Lecture 3 - Colloquium

Interpolation by bivariate polynomials

We describe some new configuration of points in the plane that admit regular interpolation by bivariate polynomials of total degree n . Results on interpolation based on Radon projections will be also presented.