İSTANBUL ANALYSIS SEMINARS

POLYNOMIALS DEVIATED LEAST FROM ZERO ON SEVERAL ARCS AND RELATED PROBLEMS

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Abstract: The solution of an extremal problem about polynomials deviated least from zero on several arcs of the unit circle is given under restrictions on the location of zeros and additional conditions on mutual position of the arcs and zeros of denominator. The extremal function is represented in terms of the density of harmonic measure. Furthermore, polynomials of the kind $p_N(z) = az^N + a_{N-1}z^{N-1} + \cdots + a_1 z + b$ with fixed $a, b, a = \bar{b}$ that deviate least from zero on one arc of the unit circle in the uniform (Chebyshev) norm are described completely. The solution is expressed either as unique cosine, or as a V.S. Videnskii's polynomial, or with the help of elliptic functions. Related problems will be discussed.

***Date*:** May 7, 2010
***Time*:** 15:40
***Place*:** Sabancı University, Karaköy Communication Center
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