PIMS / AMI Seminar

Friday, February 15, 2013
3:00 p.m.
CAB 357

"Hausdorff Geometry of Polynomials"

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Abstract

Let D(c; r) be the smallest disk, with center c and radius r, containing all zeros of the polynomial $p(z) = (z-z_1)(z-z_2) \cdot\cdot\cdot (z-z_n)$. In 1958, we conjectured that for every zero z_k of p(z), the disk $D(z_k; r)$ contains at least one zero of the derivative $p'(z)$. More than 100 papers are devoted to this conjecture, proving it for different special cases. But in general, the conjecture is proved only for the polynomials of degree $n \leq 8$. In this lecture we review the latest developments and generalizations of the conjecture.

References

[1] Brown, J. E. and G. Xiang: Proof of the Sendov conjecture for polynomials of degree utmost eight, J. Math. Anal. Appl. 232, # 2 (1999), 272–292.

[2] Khavinson D., R. Pereira, M. Putinar and E. Saff: Borcea's variance conjectures on the critical points of polynomials, arXiv:1010.5167v1 [math.CV] 25 Oct 2010

[3] Meng Z.: The critical points of polynomials, arXiv:1301.0226v1 [math.CV] 2 Jan 2013

[4] Schmiesser, G.: The Conjectures of Sendov and Smale, Approximation Theory: A v. dedic. to Bl. Sendov (B. Bojanov, Ed.), DARBA, 2002, 353 - 369.

[5] Sendov, Bl.: Hausdorff Geometry of Polynomials, East J. on Appr., 7 # 2 (2001), 1 - 56.

Refreshments will be served in CAB 649 at 2:30 p.m.