Seminar on Combinatorial Computing
October 24, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

Circumscribed polygons of small area

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Abstract

Given any strictly convex disk K and any positive integer $n \geq 3$, we prove that there exists a convex n-gon C_n, circumscribed about K and a convex $2n$-gon I_{2n}, inscribed in K such that $\frac{Area(I_{2n})}{Area(C_n)} \geq cos\, \frac{\pi}{n}$, with equality when K is an ellipse. This generalizes a result of Chakerian who proved the above inequality for $n = 3$ and $n = 4$. As a consequence, for every positive integer $5 \leq n \leq 11$ we improve the best known bounds for $\sup \inf \frac{Area(C)}{Area(K)}$ where the supremum is taken over all convex disks K and the infimum is taken over all convex n-gons C circumscribed about K.

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or visit our website
http://www.math.nyu.edu/∼pach/public_html/combinatorics_seminar.html