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Best and random approximations with generalized disc-polygons

In this talk, we consider the asymptotic behaviour of the distance between a convex disc K with sufficiently smooth boundary, and its approximating n -gons, as the number of vertices tends to infinity. We consider two constructions: the best approximating inscribed n -gons with respect to several notions of distance; and random inscribed n -gons obtained by taking the convex hull of n i.i.d. random points chosen from the boundary of K . The asymptotic behaviour of the area deviation of K and the n -gon depend in both cases on the same, geometric limit. The best and random approximating n -gons are defined similarly in the circumscribed case.

We generalize the existing results on linear and spindle convexity to the so-called L -convexity. In the case of inscribed L -polygons, we prove similar asymptotic formulas by generalizing the geometric limits. We also introduce a notion of L -convex duality and consider the properties of the dual disc, which results are then used to prove formulas in the circumscribed case.

Joint work with Viktor Vígh (University of Szeged, Hungary).

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