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Erdős, Paul; Totik, Vilmos

On the size of products of distances from prescribed points. (In English)

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The following problem, raised in a mathematical contest, is investigated:

“Let E be any connected set in the plane of diameter greater than 4, and let Z_1, Z_2, \dots be any sequence of points on the plane. Then there is a point $X \in E$ for which infinitely many of the products $\overline{XZ_1} \cdot \dots \cdot \overline{XZ_n}$ are greater than 1. Furthermore, the same is not necessarily true if the diameter of E is 4.”

The problem can be simplified to segments E of length greater than 4. In the paper, the limit case of segments of length 4 is considered. A more precise formulation of the above result for segments greater than 4 is obtained, and the case of more general sets E is studied.

G.Plonka (Rostock)

Classification:

41A10 Approximation by polynomials

12E10 Special polynomials over general fields

Keywords:

Chebyshev polynomials; Fekete set