Erdős, Paul; Purdy, George

Some extremal problems in geometry. V. (English) [Zbl 0403.52006]

[For the entire collection see Zbl 0396.00002.]

The authors continue their investigation of bounds for several functions occurring in problems of Combinatorial Geometry (for part IV, see Proc. 7th south-east. Conf. Comb., Graph Theory, Comput.; Baton Rouge 1976, 307-322 (1976; Zbl 0345.52007). Their results concern the number of different volumes of simplices formed from \(n\) given points in a Euclidean space, the number of planes determined by \(n\) given points, and the number of triangles determined by \(n\) points in the plane. Examples: Given \(n\) points in \(E^3\), no three on a line, not all on a plane, there are at least \(cn^{3/4}\) distinct volumes of simplices formed from these points, where \(c\) is a constant. Then \(n\) vertices of polyhedron in \(E^3\) determine at least \(\binom{n-2}{2} + 1\) planes, provided \(n \geq 552\).

Reviewer: R. Schneider

For a scan of this review see the web version.

MSC:

52A37 Other problems of combinatorial convexity

Keywords:

simplices formed from \(n\) given points; number of different volumes of simplices; Euclidean space