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*Multiplicities of interpoint distances in finite planar sets.* (In English)

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For a set  $X$  of  $n$  points in the plane, let  $d_1, \dots, d_m$  denote the different positive distances between the points of  $X$ , and  $r_k$  the multiplicity of  $d_k$ . The authors study the vector  $r(X) = (r_1, \dots, r_m)$ , where the numbering is chosen such that  $r_1 \geq r_2 \geq \dots \geq r_m$ . The case where  $X$  is the set  $V$  of vertices of a convex polygon is considered particularly. For  $n = 5$  and  $m \in \{2, 3\}$ , the possible vectors  $r(X)$  and  $r(V)$  are completely specified. For  $n = 6$ , it is shown that  $r(X)$  cannot be equal to  $(7, 7, 1)$ . There is a discussion of some known results and several challenging conjectures which are related to this topic.

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Classification:

52C10 Erdos problems and related topics of discrete geometry

Keywords:

minimum number of different distances; multiplicity vector