

**Zbl 737.52006**

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*Midpoints of diagonals of convex  $n$ -gons.* (In English)

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The authors' abstract: "Let  $f(n)$  be the minimum over all convex planar  $n$ -gons of the number of different midpoints of the  $\binom{n}{2}$  line segments, or diagonals, between distinct vertices. It is proved that  $f(n)$  is between approximately  $0.8\binom{n}{2}$  and  $0.9\binom{n}{2}$ . The upper bound uses the fact that the number of multiple midpoints, shared by two or more diagonals, can be as great as about  $\binom{n}{2}/10$ . Cases for which the number of midpoints is at least  $\lceil n(n-2)/2 \rceil + 1$ , the number for a regular  $n$ -gon when  $n$  is even, are noted."

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Classification:

52A37 Other problems of combinatorial convexity

52A10 Convex sets in 2 dimensions (including convex curves)

Keywords:

convex  $n$ -gons; diagonal midpoints; multiple midpoints