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Integral complex geometry

A subject, treated in this report, combines in one bundle some questions of complex analysis, geometry and probability theory. First investigations of geometric probability start from well known Buffon's needle problem and related paradoxes.

Let a needle be considered as a real line, and then the problem reduces to finding some invariant measure of set relative to movement (L. Santalo, G. Matheron, R. Ambarcumian).

Other problems: estimation properties of set under investigation if properties of its intersections with families of some sets are well known:

- 1) with planes of fixed dimension:
 - a) real case (G. Auman, A. Kosinski, E. Shchepin);
 - b) complex case (Yu.Zelinskii);
- 2) with a set of vertex of an arbitrary rectangle (A. Besicowitch, L. Danzer, T. Zamfirescu, M. Tkachuk).

Open problems.

1. Let C be closed Jordan curve in \mathbb{R}^2 and for arbitrary curve L of order n from property intersection $C \cap L$ contains m points follows, that $C \cap L$ contains no less than $m + 1$ points. Do there exists a number m , that from property above follows C be curve of order n ?
 2. Let in previous question L be a circle and $m = 3$, is it true, that C also be a circle?
 3. The same questions, if C be compact and set $\mathbb{R}^2 \setminus C$ be not connected.
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