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Osculation vertices in arrangements of curves. (In English)

Geometriae dedicata 1, 322-333 (1973); correction 3, 130 (1974).

Let C_1, \dots, C_n be n simple closed curves. Assume that $C_i \cap C_j$ is either empty or is a single point or is a pair of points at which the two curves cross each other. Denote by $\omega(n)$ the largest integer for which there are n curves and $\omega(n)$ points $x_i, i = 1, \dots, \omega(n)$ so that to each i there exists j_1 and j_2 so that the only intersection of C_{j_1} and C_{j_2} is x_i . The authors prove: there exist constants $c_1, c_2 > 0$ such that $c_1 n^{4/3} < \omega(n) < c_2 n^{5/3}$ and if the C_i are all circles there exists c_3 such that $\omega(n) > n^{1+c_3/\log \log n}$. Several open related problems are discussed.

Classification:

52A40 Geometric inequalities, etc. (convex geometry)

52C17 Packing and covering in n dimensions (discrete geometry)

05C99 Graph theory