Erdős, Paul; Purdy, G.
Two combinatorial problems in the plane. (In English)
Discrete Comput. Geom. 13, No.3-4, 441-443 (1995). [0179-5376]

This paper contains the authors' solution to one problem about arrangements of lines and points in the plane, and a partial solution, due to Dean Hickerson, of another. (The connecting theme is that both problems were posed in a 1978 paper by the same authors.) Let t_n, $n = 2, 3, \ldots$, be the number of lines of the arrangement containing exactly n points; and let ε be the lesser of $\{t_3/t_2, 1\}$. It is shown that absolute positive constants C_1, C_2 exist such that if the number of points is n, the total number of lines determined by the points is at least $C_1 \in n^2$; and t_3 is at least $C_2 \varepsilon^2 n^2$.

The second problem asks how small a set T can be, if there is an n-point noncollinear set S, disjoint from T, such that every line through two or more points of S contains a point of T. For $n \geq 6$, a construction, due to Hickerson, is given for a pair (S, T) such that $|S| = n$, $|T| = n - 2$.

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Classification:
52A37 Other problems of combinatorial convexity
00A07 Problem books

Keywords:
arrangements; lines; points; plane