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Omittable Lines

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Abstract

Given a collection of n lines in the real projective plane, a line ℓ is said to be *omittable* if ℓ is free of ordinary points of intersection—in other words, if all the intersection points of ℓ with other lines from the collection come at the intersection of three or more lines. Given a collection of lines $\mathcal{L}$, denoting by $O(\mathcal{L})$ the set of all omittable lines in the collection and by $g(L)$ the cardinality of $O(\mathcal{L})$, we describe three infinite families of lines that can serve as $O(L)$ for suitable $\mathcal{L}$ and also display a finite set of sporadic additional examples such that $O(\mathcal{L})$ does not fall into any of the three families. We derive bounds on the size of $g(\mathcal{L})$ in case $O(\mathcal{L})$ falls into one of the three infinite families and weaker bounds for the more general case.

Keywords: Aggregates, arrangements, omittable lines.

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Pogrešljive premice

Povzetek

Premici ℓ dane razporeditve n premic v realni projektivni ravnini pravimo *pogrešljiva*, če nima navadnih presečišč – z drugimi besedami, če so vsa presečišča premice ℓ z drugimi premicami razporeditve preseki najmanj treh premic. Če imamo razporeditev premic $\mathcal{L}$, označimo z $O(\mathcal{L})$ množico vseh pogrešljivih premic razporeditve in z $g(L)$ moč množice $O(\mathcal{L})$. Opišemo tri različne družine premic, ki lahko služijo kot $O(L)$ za primerno razporeditev $\mathcal{L}$, prikažemo pa tudi končno množico posameznih dodatnih primerov, kjer $O(\mathcal{L})$ ne pripada nobeni od teh treh družin. Izpeljemo meje za velikost $g(\mathcal{L})$, kadar $O(\mathcal{L})$ pripada eni izmed teh treh neskončnih družin, pa tudi šibkejše meje za splošnejši primer.

Ključne besede: Skupki, razporeditve, pogrešljive premice.