Zbl 129.34701
Erdős, Pál; Moser, L.
A problem on tournaments (In English)
Can. Math. Bull. 7, 351-356 (1964). [0008-4395]

A tournament on a set X (whose elements are called players) is a subset E of $X \times X$ such that $(p, q) \in E$ if and only if $p \neq q$ and $(q, p) \notin E$. We interpret $(p, q) \in E$ as meaning that p wins a game against q. Let k be a fixed positive integer. The authors prove that there exists a positive α such that, in all but $o(2^{n(n-1)/2})$ of the tournaments on n given players, every pair S, T of disjoint sets of players with $|S \cup T| \leq k$ have the property that at least $\alpha n/2^{|S \cup T|}$ of the remaining players beat all members of S and lose to all members of T. The stronger result that α can be chosen arbitrarily near to 1 is stated. Some related problems and results are discussed: inter alia the authors mention that they have characterized the minimum number of edges in an undirected graph with n vertices and no loops or multiple edges such that every k vertices have a vertex to which they are all joined.

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Classification:
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