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Choice numbers of graphs: A probabilistic approach. (English) Zbl 0793.05076

Comb. Probab. Comput. 1, No. 2, 107-114 (1992).

Summary: The choice number of a graph G is the minimum integer k such that for every assignment of a set $S(v)$ of k colors to every vertex v of G, there is a proper coloring of G that assigns to each vertex v a color from $S(v)$. By applying probabilistic methods, it is shown that there are two positive constants c_1 and c_2 such that for all $m \geq 2$ and $r \geq 2$ the choice number of the complete r-partite graph with m vertices in each vertex class is between $c_1 r \log m$ and $c_2 r \log m$. This supplies the solutions of two problems of *P. Erdős*, *A. L. Rubin* and *H. Taylor* [Combinatorics, graph theory and computing, Proc. West Coast Conf., Arcata/Calif. 1979, 125-157 (1980; Zbl 0469.05032)], as it implies that the choice number of almost all the graphs on n vertices is $o(n)$ and that there is an n vertex graph G such that the sum of the choice number of G with that of its complement is at most $O(n^{1/2}(\log n)^{1/2})$.

MSC:

05C35 Extremal problems in graph theory
05C15 Coloring of graphs and hypergraphs

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