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Extremal non-Ramsey graphs. (In English)

Graph theory, combinatorics, algorithms, and applications, Proc. 2nd Int. Conf., San Francisco/CA (USA) 1989, 42-66 (1991).

[For the entire collection see Zbl 734.00014.]

Let $\mathcal{G} = (\mathcal{G}_1, \ldots, \mathcal{G}_k)$ be a k-tuple of non-empty sets of graphs. For a graph F, the relation $F \to \mathcal{G}$ indicates that, whenever the edges of F are colored with k colors, there is an index i and graph $G \in \mathcal{G}_i$ so that there is a subgraph of F isomorphic to G with all edges assigned color i. Now let $\mathcal{F}$ be a family of graphs and define $ex(n;\mathcal{F})$ to be the maximum number of edges that a graph on n vertices can have without containing a subgraph isomorphic to a graph in $\mathcal{F}$. If $\mathcal{F}$ is the set of graphs F so that $F \not\to \mathcal{G}$ we replace $ex(n,\mathcal{F})$ with $ex(n;\not\to \mathcal{G})$.

Starting with the simple upper bound:

$$ex(n;\not\to \mathcal{G}) \leq \sum_{1\leq i\leq h} ex(n;\mathcal{G}_i)$$

the authors prove a variety of interesting equalities and inequalities about $ex(n;\not\to \mathcal{G})$.

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Classification:
05C75 Structural characterization of types of graphs
05C55 Generalized Ramsey theory
05C35 Extremal problems (graph theory)