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Size Ramsey functions. (In English)

Halász, G. (ed.) et al., Sets, graphs and numbers. A birthday salute to Vera T. Sós and András Hajnal. Amsterdam: North-Holland Publishing Company, Colloq. Math. Soc. János Bolyai. 60, 219-238 (1992). [ISBN 0-444- 98681-2/hbk]

From the authors' abstract: "For any given pair of graphs G and H there is the Ramsey number $r = r(G,H)$. Any two-coloring of the edges of a K_r will give either a G in the first color or an H in the second color, and this is denoted by $K_r \to (G,H)$. We will investigate subgraphs L of K_r such that $L \to (G,H)$. In particular, we will consider two extremal functions: the upper size Ramsey number $u(G,H)$, which is the minimum number such that if a subgraph L of K_r has at least $u(G,H)$ edges, then $L \to (G,H)$, and the lower size Ramsey number $l(G,H)$, which is the minimum number of edges in any subgraph L of K_r such that $L \to (G,H)$. For some pairs of graphs (G,H) the functions $u(G,H)$ and $l(G,H)$ will be determined precisely, and bounds will be given in other cases. Also, the relationship between the size Ramsey number $\tilde{r}(G,H)$, which is the minimum number of edges in a graph F such that $F \to (G,H)$, and the restricted size Ramsey number will be considered."

Typical of the results in this paper is:

Theorem 6. For $n \geq 3$, and $G = K_3$, B_2, or C_5,

$$u(G, K_{1,n}) = \binom{2n+1}{2} - \left[\frac{n+1}{2}\right] \quad \text{and} \quad l(G, K_{1,n}) = \binom{2n+1}{2} - \binom{n}{2}.$$

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05C55 Generalized Ramsey theory

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Ramsey functions; Ramsey number; size Ramsey number