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On Turan-Ramsey type theorems. II. (In English)

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This paper is a continuation of: *P.Erdős, V.T.Sós* [Comb. Theory Appl., Colloq. Math. Soc. János Bolyai 4, 395-404 (1970; Zbl 209.28002)], *V.T.Sós* [Conf. Comb. Struct. Appl., Calgary 1969, 407-410 (1970; Zbl 253.05145)]. Let $f(n; K_1, \ldots, k_r)$ be the largest integer for which there is an r-coloring of the edges of a complete graph K_n (the graph of the ith colored edges will be denoted by G_i) satisfying $K_{k_i} \not\subseteq G_i (1 \leq i \leq r)$ and $\sum_{i=1}^{r-1} e(G_i) = f(n; k_1, \ldots, k_r))$. The determination of the function f is considured in this paper. In particular, the following result is proved. Theorem. There are constants $c_1 > 0$ and $c_2 > 0$ such that

$$\frac{n^2}{4} + c_1 \varepsilon n^2 < f(n; 3, 3, \varepsilon n) < \frac{n^2}{4} + c_2 \varepsilon n^2,$$

where the first inequality depends upon $n > n_0(\varepsilon)$. Applications of this reasoning leads to improvement on bounds for classical Ramsey numbers, for example, they prove $r(3,3,n) = \sigma(n^3)$ or more generally $r(3,3,\ldots,3,n) = \sigma(n^{r+1})$.

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05C35 Extremal problems (graph theory)

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