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El-Zahar, M.; Erdős, Paul

On the existence of two non-neighboring subgraphs in a graph. (In English)

Combinatorica 5, 295-300 (1985). [0209-9683]

There is raised the following question: Is there a minimal integer $f(r,n)$ such that each graph G with $\chi(G) \geq f(r,n)$ and which does not contain a complete subgraph of order r must contain two non-neighboring n- chromatic subgraphs? It is known that $f(r,2)$ exists. There is shown that for a fixed n, an upper bound for $f(r,n)$, $r > n$ is given in terms of $f(r,n)$, $r \leq n$. From $f(3,3) \leq 8$ is deduced an upper bound for $f(r,3)$ and proved that a vertex critical 4-chromatic graph which does not contain two independent edges has order ≤ 13.

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