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On the connection between chromatic number, maximal clique and minimal degree of a graph. (In English)

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A well known theorem due to Brooks can be stated as: For $r \geq 4$, any graph G has at most 2 of the following properties: (1) K_r is not contained in G. (2) The chromatic number of G is at least r. (3) The maximum degree of G is at most $r-1$. In this paper the following analogue of Brooks' Theorem is proved via a sequence of lemmas: For $r \geq 3$, any graph G with n vertices has at most two of the following properties: (4) K_r is not contained in G. (5) The chromatic number of G is at least r. (6) The minimum degree of G is greater than $((3r-7)/(3r-4))n$. The authors also show that if $(3r-4)$ divides n, then there exists a unique graph G of order n such that (4) and (5) hold, but the minimum degree of G is $((3r-7)/(3r-4))n$.

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Classification:
05C15 Chromatic theory of graphs and maps
05C35 Extremal problems (graph theory)