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SOME TOUGHNESS RESULTS IN INDEPENDENT DOMINATION CRITICAL GRAPHS

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Abstract

A subset S of $V(G)$ is an independent dominating set of G if S is independent and each vertex of G is either in S or adjacent to some vertex of S. Let $i(G)$ denote the minimum cardinality of an independent dominating set of G. A graph G is k-i-critical if $i(G) = k$, but $i(G + uv) < k$ for any pair of non-adjacent vertices u and v of G. In this paper, we establish that if G is a connected 3-i-critical graph and S is a vertex cutset of G with $|S| \geq 3$, then $\omega(G - S) \leq \frac{1 + \sqrt{8|S| + 1}}{2}$, improving a result proved by Ao [3], where $\omega(G - S)$ denotes the number of components of $G - S$. We also provide a characterization of the connected 3-i-critical graphs G attaining the maximum number of $\omega(G - S)$ when S is a minimum cutset of size 2 or 3.

Keywords: domination critical, toughness.

2010 Mathematics Subject Classification: 05C69.

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doi:10.1016/0095-8956(83)90007-2