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Andrzej ŻAK

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On $(Kq; k)$-stable graphs

Andrzej Żak*

AGH University of Science and Technology, Al. Mickiewicza 30, 30-059 Kraków, Poland

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Abstract

A graph G is called $(H; k)$-*vertex stable* if G contains a subgraph isomorphic to H ever after removing any k of its vertices. By $\mathrm{stab}(H; k)$ we denote the minimum size among the sizes of all $(H; k)$-vertex stable graphs. Given an integer $q \geq 2$, we prove that, apart of some small values of k, $\mathrm{stab}(K_q; k) = (2q-3)(k+1)$. This confirms in the affirmative the conjecture of Dudek et al. [(H, k) stable graphs with minimum size, Discuss. Math. Graph Theory 28(1) (2008) 137–149]. Furthermore, we characterize all extremal graphs.