K-DOMINATING GRAPHS

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Let $G$ be a graph and let $k \geq \gamma(G)$ be an integer. The $k$-dominating graph of $G$, $D_k(G)$, is the graph whose vertices correspond to the dominating sets of $G$ of cardinality at most $k$ and where two vertices are adjacent if and only if the corresponding dominating sets of $G$ differ either by adding or deleting a single vertex.

Let $d_0(G)$ be the smallest integer such that $D_k(G)$ is connected for all $k \geq d_0(G)$. Haas and Seyffarth [1] showed that $\Gamma + 1 \leq d_0(G) \leq \min\{|V(G)|-1, \Gamma(G)+\gamma(G)|$. Furthermore, they exhibited classes of graphs where $d_0(G) = \Gamma(G) + 1$ [1, 2] and Suzuki et al. [3] showed that there exists graphs where $D_{\Gamma+1}$ is not connected.

In this talk we consider when the upper bound on $d_0(G)$ can be improved and present a class of graphs for which $d_0(G) = \Gamma + \gamma$.

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References

