k-DOMINATION OF CARTESIAN PRODUCT OF COMPLETE GRAPHS

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A set S of vertices in V is said to be k-dominating if every vertex in $V \setminus S$ is adjacent to at least k vertices in S. The k-domination number, $\gamma_k(G)$, is the minimum cardinality of a k-dominating set in G. The Cartesian Product of Complete Graphs, denoted $\gamma_k(K_i \square K_j)$, has elements that mimic the n-queens puzzle, except with rooks. Closed formulas for $i = j$ and specific k have been found. Results about arbitrary k have also been included. These findings, along with an upper bound result, have been used to find bounds for arbitrary i, j. Asymptotic behavior has been determined using the closed formula. The boundary issues for small values of i, j and k have also been investigated.

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