MAKER-BREAKER DOMINATION GAME ON CARTESIAN PRODUCTS OF GRAPHS

Pakanun Dokyeesun

University of Ljubljana
e-mail: papakanun@gmail.com

The Maker-Breaker domination game is played on a graph G by two players, called Dominator and Staller. They alternately select an unplayed vertex in G. Dominator wins the game if he forms a dominating set while Staller wins the game if she claims all vertices from a closed neighborhood of a vertex $v \in V(G)$. Recently, Forcan and Qi studied the Maker-Baker domination game on Cartesian products of graphs. It was shown that if Dominator wins the D-game and S-game on G, then Dominator also wins the games on the Cartesian product of G and H for any arbitrary H. In our work, we show the winner of the game on the product of paths, stars, and complete bipartite graphs and how fast the winner wins. Dominator is the winner on $P_m \Box P_n$ in both the D-game and the S-game, and $\gamma_{mb}(P_m \Box P_n)$ and $\gamma'_{mb}(P_m \Box P_n)$ were determined when $m = 3$ and $3 \leq n \leq 5$. Dominator wins on $G \Box H$ on the both games if G and H have nontrivial path cover. In addition, he also wins on $K_{m,n} \Box K_{m',n}$ where $n \geq m \geq 2$ and $n' \geq m' \geq 2$. However, if $n \geq m \geq 3$, then Staller wins on $K_{1,m} \Box K_{1,n}$ in the both games.

References

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