

CONVEX AND WEAKLY CONVEX DOMINATION IN PRISM GRAPHS

MONIKA ROSICKA

*Faculty of Mathematics, Physics and Informatics
University of Gdańsk, 80–952 Gdańsk, Poland*

*Institute of Theoretical Physics and Astrophysics and
National Quantum Information Centre in Gdańsk
81–824 Sopot, Poland*

e-mail: mrosicka@inf.ug.edu.pl

Abstract

For a given graph $G = (V, E)$ and permutation $\pi : V \mapsto V$ the prism πG of G is defined as follows: $V(\pi G) = V(G) \cup V(G')$, where G' is a copy of G , and $E(\pi G) = E(G) \cup E(G') \cup M_\pi$, where $M_\pi = \{uv' : u \in V(G), v = \pi(u)\}$ and v' denotes the copy of v in G' .

We study and compare the properties of convex and weakly convex dominating sets in prism graphs. In particular, we characterize prism γ_{con} -fixers and -doubblers. We also show that the differences $\gamma_{wcon}(G) - \gamma_{wcon}(\pi G)$ and $\gamma_{wcon}(\pi G) - 2\gamma_{wcon}(G)$ can be arbitrarily large, and that the convex domination number of πG cannot be bounded in terms of $\gamma_{con}(G)$.

Keywords: domination, prism graphs.

2010 Mathematics Subject Classification: 05C69.

REFERENCES

- [1] A.P. Burger, C.M. Mynhardt and W.D. Weakley, *On the domination number of prisms of graphs*, Discuss. Math. Graph Theory **2** (2004) 303–318.
doi:10.7151/dmgt.1233
- [2] G. Chartrand and F. Harary, *Planar permutation graphs*, Ann. Inst. Henri Poincaré **3** (1967) 433–438.
- [3] M. Lemańska and R. Zuazua, *Convex universal fixers*, Discuss. Math. Graph Theory **32** (2012) 807–812.
doi:10.7151/dmgt.1631

- [4] C.M. Mynhardt and Z. Xu, *Domination in prisms of graphs: universal fixers*, Util. Math. **78** (2009) 185–201.
- [5] M. Rosicka, *A proof of the universal fixer conjecture*, Util. Math., to appear.
- [6] K. Wash, *Edgeless graphs are the only universal fixers*, Czechoslovak Math. J. **64** (2014) 833–843.
doi:10.1007/s10587-014-0136-3

Received 24 November 2017

Revised 3 September 2018

Accepted 3 September 2018