The Tree Number of Power Graphs Associated With Specific Groups and Applications

A. R. Moghaddamfar

Department of Mathematics, K. N. Toosi University of Technology,
P. O. Box 16315-1618, Tehran, Iran
E-mail: moghadam@kntu.ac.ir

Abstract

The power graph $P(G)$ of a group $G$ is an undirected graph whose vertex set is $G$ and two vertices $x, y \in G$ are adjacent if and only if $\langle x \rangle \subseteq \langle y \rangle$ or $\langle y \rangle \subseteq \langle x \rangle$ (which is equivalent to say $x \neq y$ and $x^m = y$ or $y^m = x$ for some non-negative integer $m$). Clearly, the power graph $P(G)$ of any group $G$ is always connected. The number of spanning trees of the power graph $P(G)$ of a group $G$, which is denoted by $\kappa(G)$ and call the tree-number of $G$, will be investigated for certain finite groups $G$ in this talk. Indeed, the explicit formula for the tree-number of a cyclic group or a generalized quaternion group is obtained. We have also determined, up to isomorphism, the structure of any finite group $G$ for which $\kappa(G) < 125$.

AMS Subject Classification 2010: 05C10, 05C45.

Keywords and Phrases: power graph, tree-number, cyclic group, generalized quaternion group.

References

