

\mathbb{Z}_q -supermagic labeling of $C_m \square C_n$

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A graph $G = (V, E)$ with $|V| = p, |E| = q$ is called Γ -*supermagic* if there exists a bijection h from E to an Abelian group Γ of order q such that the weight $w(x)$ of each vertex x is equal to the same element μ of the group Γ , that is,

$$w(x) = \sum_{xy \in E} h(xy) = \mu$$

for all $x \in V$ and some $\mu \in \Gamma$. The labeling is called a Γ -*supermagic labeling* or sometimes also Γ -*vertex magic edge labeling*.

We present two different methods of \mathbb{Z}_q -supermagic labeling of Cartesian products of two cycles.