On the partition dimension and connected partition dimension of wheels *

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Abstract

Let G be a connected graph. For a vertex $v \in V(G)$ and an ordered k-partition $\Pi = \{S_1, S_2, ..., S_k\}$ of $V(G)$, the representation of v with respect to Π is the k-vector $r(v|\Pi) = (d(v, S_1), d(v, S_2), ..., d(v, S_k))$. The k-partition Π is said to be resolving if the k-vectors $r(v|\Pi)$, $v \in V(G)$, are distinct. The minimum k for which there is a resolving k-partition of $V(G)$ is called the partition dimension of G, denoted by $pd(G)$. A resolving k-partition $\Pi = \{S_1, S_2, ..., S_k\}$ of $V(G)$ is said to be connected if each subgraph $< S_i >$ induced by S_i $(1 \le i \le k)$ is connected in G. The minimum k for which there is a connected resolving k-partition of $V(G)$ is called the connected partition dimension of G, denoted by $cpd(G)$. In this paper, the partition dimension as well as the connected partition dimension of the wheel W_n with n spokes are considered, by showing that $\lceil (2n)^{1/3} \rceil \le pd(W_n) \le 2\lceil n^{1/2} \rceil + 1$ and $cpd(W_n) = \lceil (n+2)/3 \rceil$ for

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$n \geq 4$.

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