

Prime labelings on planar grid graphs

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A graph G is said to be *prime* if there is a bijective function $f : V(G) \rightarrow \{1, 2, \dots, |V(G)|\}$ such that $f(u)$ and $f(v)$ are relatively prime whenever u is adjacent to v . It is known that for any prime p and any integer n such that $1 \leq n \leq p$, there exists a prime labeling on the $p \times n$ planar grid graph $P_p \times P_n$. We show that $P_p \times P_n$ has a prime labeling for any odd prime p and any integer n such that $p < n \leq p^2$. We discuss how this approach may lead to prime labeling on $P_p \times P_n$ for any odd prime p and any positive integer n .

Keywords: Prime graph, prime labeling, planar grid graph, Cartesian product of paths