

## Prime labelings of generalized Petersen graphs and large cubic bipartite graphs

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A graph  $G$  is called *prime* if there exists a labeling of the vertices of  $G$  with distinct labels  $1, 2, \dots, |V(G)|$  such that the labels on any two adjacent vertices are relatively prime; such a labeling is called a *prime labeling*. In general, bipartiteness is neither necessary nor sufficient for a graph to be prime. S. Schluchter, J.Z. Schroeder, T. Wilson, et. al. conjectured that a generalized Petersen graph  $P(n, k)$  is prime if and only if it is bipartite, which occurs for  $n$  even and  $k$  odd, and they verified that the conjecture holds for all even  $n \leq 50$  and all possible odd  $k$ . We give more evidence to support this conjecture. In this talk we will develop a prime labeling algorithm that has verified the conjecture for all even  $n$  and odd  $k$  such that  $2 \leq n \leq 9000$  and all possible odd  $k$ . We also develop a different prime labeling method that we have used to prime label all cubic bipartite graphs  $G$  such that  $8 \leq |V(G)| \leq 22$ .

Keywords: graph labeling, generalized Petersen graph, prime graph.