Most wheel related graphs are not vertex magic *

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Abstract. Suppose G is a finite graph with vertex-set $V(G)$ and edge-set $E(G)$. A one-to-one map λ from $V(G) \cup E(G)$ onto the integers $1, 2, 3, \ldots, |V(G)| + |E(G)|$ is called a *vertex-magic total labeling*, if there exists a constant h so that for every vertex x,

$$\lambda(x) + \sum \lambda(xy) = h$$

where the sum is taken over all vertices y adjacent to x. The constant h is called the *magic constant* for λ. A graph with a vertex-magic total labeling will be called *vertex-magic*. In this paper, we consider the vertex-magic total labeling of wheel related graphs such as Jahangir graphs, helms, webs, flower graphs and sunflower graphs.

1 Introduction

All graphs in this paper will be finite, simple and undirected. The graph $G = G(V, E)$ has vertex-set $V = V(G)$ and edge-set $E = E(G)$ and we denote $|V(G)|$ and $|E(G)|$ by v and e, respectively. We follow either Wallis [10] or West [11] for most of the graph theory terminology and notation used in this paper.

A *labeling* (or *valuation*) of a graph is a map that carries graph elements to numbers (usually to the positive or non-negative integers). If the domain is the vertex-set or the edge-set, the labelings

* The research was done while the second author visiting School of Mathematical Sciences, GC University Lahore, Pakistan and it is partially supported by School of Mathematical Sciences and Higher Education Commission of Pakistan