

On the Integer-Magic Spectra of Dumbbell-Friendship Graphs

Leyda Almodóvar, Emily Brady, Michaela Fitzgerald, Hsin-Hao Su*, and Heiko Todt, Stonehill College.

For a positive integer k , a graph $G = (V, E)$ is \mathbb{Z}_k -magic if there exists a function, namely, a labeling, $l : E(G) \rightarrow \mathbb{Z}_k^*$ such that the induced vertex set labeling $l^+ : V(G) \rightarrow \mathbb{Z}_k$, where $l^+(v)$ is the sum of the labels of the edges incident with a vertex v is a constant map. Note that 1-magic is \mathbb{Z} -magic. The set of all positive integer k such that G is k -magic is denoted by $\text{IM}(G)$. We call this set the *integer-magic spectrum* of G . In this paper, we investigate the integer-magic spectra of the dumbbell-friendship graphs, which joins two generalized friendship graphs with an additional edge between the common vertices of each friendship graph, and the exact values are presented.

Keywords: magic labeling, integer-magic spectrum, dumbbell graphs, friendship graphs