

Face-magic calendula graphs

Bryan Freyberg,* Gretta Jensen, Ethan Peters, Ryan Purrington, Kaysie Scott

Department of Mathematics and Statistics, University of Minnesota Duluth, Duluth, MN 55812, frey0031@d.umn.edu

The calendula graph $Cal(m, n)$ consists of a central m -cycle and m peripheral n -cycles such that each peripheral cycle shares a unique edge with the central cycle. For a planar graph $G = (V, E, F)$ and $a, b, c \in \{0, 1\}$, a labeling of type (a, b, c) is an assignment of the integers $\{1, 2, \dots, a|V| + b|E| + c|F|\}$ to the elements of $V \cup E \cup F$ so that each vertex, edge, and face receives exactly a , b , and c labels, respectively. Such an assignment is called face-magic if for each n -sided face, the sum of the label of the face and the labels surrounding the face is equal to some fixed constant $\mu(n)$. We completely classify a, b, c, m , and n such that $Cal(m, n)$ admits a face-magic labeling of type (a, b, c) .