# Face-magic labelings of type $(a, b, c)$

Assume that $a, b, c \in \{0, 1\}$. A labeling of type $(a, b, c)$ assigns labels from the set $\{1, 2, 3, \ldots, a|V(G)| + b|E(G)| + c|F(G)|\}$ to the vertices, edges and faces of $G$ in such a way that each vertex receives $a$ labels, each edge receives $b$ labels, and each face receives $c$ labels and each number is used exactly once as a label. Labelings of types $(1, 0, 0)$, $(0, 1, 0)$ and $(0, 0, 1)$ are also called *vertex, edge* and *face* labelings, respectively.

The *weight* of a face under a labeling is the sum of labels (if present) carried by that face and the edges and vertices surrounding it.

A labeling of type $(a, b, c)$ is said to be *face-magic* (Ko-Wei Lih, 1983) if for every number $s$, all $s$-sided faces have the same weight.

We allow different weights for different $s$.

*Face-magic* labelings of type $(1, 1, 0)$ and type $(1, 1, 1)$ are investigated in the following papers:

• Ahmad, A. - Bača, M - Lascsáková, M. - Semaničová- Feňovčíková, A.: *Super magic and antimagic labelings of disjoint union of plane graphs*, **Science International 24** Issue 1 (2012), 21-25.

• Bača, M. - MacDougall, J.A. - Miller, M. - Slamin - Wallis, W.D.: *Survey of certain valuations of graphs*, **Discussiones Math. Graph Theory 20** (2000), 219-229.

• Bača, M.: *Labelings of two classes of plane graphs*, **Acta Math. Appl. Sinica 9** (1993), 82-87.

• Bača, M.: *On magic labelings of honeycomb*, **Discrete Math. 105** (1992), 305-311.

• Bača, M.: *On magic labelings of grid graphs*, **Ars Combin. 33** (1992), 295-299.

• Bača, M.: *On magic labelings of type $(1, 1, 1)$ for the special class of plane graphs*, **J. Franklin Inst. 329** (1992), 549-553.

• Bača, M.: *On magic labelings of convex polytopes*, **Ann. Discrete Math. 51** (1992), 13-16.

• Bača, M. - Holländer, I.: *Labelings of certain class of convex polytopes*, **Journal Franklin Inst. Vol. 329**, No. 3 (1992), 539-547.

• Bača, M.: *On magic labelings of m-prisms*, **Math. Slovaca 40** (1990), 11-14.

• Bača, M.: *On magic labelings of type $(1, 1, 1)$ for three classes of plane graphs*, **Math. Slovaca 39** (1989), 233-239.

• Bača, M.: *On magic labelings of Mőbius ladders*, **J. Franklin Inst. 326** (1989), 885-888.

• Bača, M.: *Labelings of m-antiprisms*, **Ars Combin. 28** (1989), 242-245.

• Bača, M.: *Labelings of two classes of convex polytopes*, **Utilitas Math. 34** (1988), 24-31.

• Bača, M.: *On magic and consecutive labelings for the special classes of plane graphs*, **Utilitas Math. 32** (1987), 59-65.