

**BĂRZĂ, Silviu, NUMBER OF ISOMORPHIC GRAPHS WITH THE SAME DIAGONAL CELL TYPE WALKS MATRIX**

**Abstract:** Considering a graph  $G$  with diagonal cell type walks matrix, the goal is to determine the number of isomorphic graph  $H$  with  $G$  for which  $H$  has the same diagonal cell type walks matrix as  $G$ . For this operation only combinatorics and graph theory (without using isomorphism properties from algebra) are used. Firstly, some graph theory definitions used in this paper are presented. Two simple cases (equal dimensioned graph components and distinct dimensioned graph components) are presented in the first part. Then, the general case is described.

**Keywords:** isomorphic graphs, walks matrix, enumeration problem.

**AMS Classification:** 05C30, 05C60, 05C75