

1038-05-138

Robert G. Donnelly* (rob.donnelly@murraystate.edu), Dept. of Mathematics and Statistics, Faculty Hall 6C, Murray State University, Murray, KY 42071. *The numbers game and Dynkin diagram classification results.*

The numbers game is a one-player game played on a finite simple graph with certain integer weights assigned to its edges. We show how graphs possessing a certain finiteness property with respect to this game correspond precisely to the Dynkin diagrams for the finite-dimensional complex semisimple Lie algebras. One proof uses a topological characterization of the set of starting positions for convergent numbers games. Those matrices for which there exist finite posets with certain structural properties are consequently shown to be the Cartan matrices associated to these semisimple Lie algebras. As a further application, a combinatorial characterization of nice distributive lattice models of the Weyl characters for the irreducible representations of the rank two semisimple Lie algebras is given. Further related problems are discussed. (Received February 05, 2008)