James Alexander and Paul Hearding

Abstract

Some well-known results of Prodinger and Tichy are that the number of independent sets in the n-vertex path graph is F_{n+2}, and that the number of independent sets in the n-vertex cycle graph is L_n. We generalize these results by introducing new classes of graphs whose independent set structures encode the Lucas sequences of both the first and second kind. We then use this class of graphs to provide new combinatorial interpretations of the terms of Dickson polynomials of the first and second kind.