

1176-13-290

Jennifer Biermann, Selvi Kara, Kuei-Nuan Lin and Augustine O’Keefe*
(aokeefe@conncoll.edu). *Toric Ideals of Weighted Oriented Graphs.*

Given a vertex-weighted oriented graph, we can associate to it a set of monomials. We consider the toric ideal whose defining map is given by these monomials. We find a generating set for the toric ideal for certain classes of graphs which depends on the combinatorial structure and weights of the graph. We provide a result analogous to the unweighted, unoriented graph case, to show that when the associated simple graph has only trivial even closed walks, the toric ideal is the zero ideal. Moreover, we give necessary and sufficient conditions for the toric ideal of a weighted oriented graph to be generated by a single binomial and we describe the binomial in terms of the structure of the graph. (Received January 25, 2022)