On the Characterizing Properties of Star Polynomials

Natalya Coleen Williams

This thesis examines the characterizing properties of the star polynomial of a graph. It extends the work previously done in this area and introduces new results. Analytical, as well as computer techniques are used to establish the star characterizations of unions of families of graphs.

If the star polynomial of a general member of a family of graphs is known, then any graph that is co-star to that member has the same star polynomial. It is found that certain families of graphs have terms in their star polynomials that are unique to the family. The star polynomial may tell which family a graph belongs to; but does not give sufficient information, in some cases, to identify the family member. The concept of characterizing a graph up to family is explored.

The star polynomials of the members of certain families of graphs are generated using a computer investigation.

Keywords: m - star, star polynomial, star characterization up to family