

1125-05-74

J. Hu, E. Shan, C. Wang, Shaohui Wang* (shaohuiwang@yahoo.com) and **B. Wei.** *Total domination polynomials of graphs.* Preliminary report.

Given a graph G , a total dominating set D_t is a set that every vertex of G is adjacent to some vertices of D_t and let $d_t(G, i)$ be the number of all total dominating sets with size i . The total domination polynomial, defined as $D_t(G, x) = \sum_{i=1}^{|V(G)|} d_t(G, i)x^i$, recently has been the focus of considerable extended research in the field of domination theory. In this paper, we obtain the vertex-reduction and edge-reduction formulas of total domination polynomials. As consequences, we give the total domination polynomials for paths and cycles. Additionally, we determine the sharp upper bounds of total domination polynomials for trees and characterize the corresponding graphs with such bounds. Finally, we use the reduction-formulas to investigate the relations between vertex sets and total domination polynomials in G . (Received July 11, 2016)