

## Introduction to Paired Domination Polynomial of a Graph

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**Abstract :** One of the algebraic representation of a graph is the graph polynomial. In this article, we introduce the paired-domination polynomial of a graph  $G$ . The paired-domination polynomial of a graph  $G$  of order  $n$  is the polynomial  $D_p(G, x)$  with the coefficients  $dp(G, i)$  where  $dp(G, i)$  denotes the number of paired dominating sets of  $G$  of cardinality  $i$  and  $\gamma_{pd}(G)$  denotes the paired-domination number of  $G$ . We obtain some properties of  $D_p(G, x)$  and its coefficients. Further, we compute this polynomial for some families of standard graphs. Further, we obtain some characterization for some specific graphs.

**Keywords :** domination polynomial, paired dominating set, paired domination number, paired domination polynomial

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