

# Co r-Equality Domination in Graphs

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## Abstract

There are a lot of studies and scientific researches on domination and its different types. We introduce new types of domination.  $D$  is known as a co- $r$ -equality dominating set because  $D \subseteq V(G)$ , such that  $\forall v \in V - D$ , where  $r$  vertices in  $D$  dominate the vertex  $v$ . The cardinality minimum of all  $MC^rEDS$  is known as the co- $r$ -equality dominance number, as shown by  $\gamma_{cre}(G)$ . We determine best possible upper and lower bounds for  $\gamma_{crs}(G)$ , discussed for several standard graphs such as : complete, complete bipartite, wheel graphs.

## 1.Introduction

Graph theory a fundamental structure in mathematics used to explain relationships between entities here can be found in [1, 2, 3, 4] . One of the most fundamental subjects within discrete mathematics [5]. A graph is a representation of point or nodes (vertices) connected by lines (edges) [6]. The subject has links to many branches of mathematics, including topology, algebra, probability and numerical analysis. We need graphics in our real life, such as cities, street, service agencies, and homes. In fact, dominance refers to the set of segment that govern all vertices (edges) in graph [7]. There for, vertices or edges can dominate the graph. Studying the issues of one of the topics of graph theory that is expanding the fastest is dominance. It is widely used in traffic jams, communication network, war planning, coding theory, social media, DNA analysis electrical communications and more,[18,19,20]. The importance of dominance in different applications gives rise to different types of dominance for this purpose[ 8, 9, 10, 11]. Dominant parameters are formed by imposing conditions on the dominant set, or by imposing condition on the outside of the dominant set, there are also definitions that include both methods. Here, the co- $r$ -equality domination model of graph dominance is shown. There are limits on the co- $r$ -equality domination number related to a graph's order, size, minimum degree, maximum degree, and other attributes. The co- $r$ -equality dominance is calculated for a few modified and known graphs.

## 2. Co r-Equality Domination

Definition 2.1. Let  $G$  be a graph of order  $n$  and  $D \subseteq V$  such that  $\forall v \in V - D$ , there are  $r$  vertices in  $D$  dominate the vertex  $v$ , so  $D$  is called a co- $r$ -equality dominating set ( $C^rEDS$ ).

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