Generalizing the Formulae for the Wiener Indices of the Double Vertex Graphs of Certain Families of Graphs

Oransoy, Olcay (School: Izmir Bahcesehir College 50. Year Science and Technology High School)

Graphs are defined as a set of vertices and a set of edges consisting of unordered pairs of vertices. They can be used to model many real-world structures, systems and especially networks. They aren't particularly old topics of interest, the first academic work on graphs were done by Leonhard Euler in 1736. Since then, many functions, indices and graph-valued functions on graphs have been created and studied by many modern prevalent mathematicians. My project's topics of interest consist of the Double Vertex function and the Wiener index. Through the course of this project, we have both analytically and logically derived the formula for the Wiener index of the Double Vertex graphs of path, cycle, wheel, and complete graphs, where these derivations could also be used to determine the formula for other graph families.

Awards Won: