Abstract

Project Code: RSA57- กิตติกร นาคประสิทธิ์

Project Title: Game Theoretical Variations of Graph Colorings

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This project investigates two parameters in graph colorings, namely, equitable vertex k-arboricity and game coloring number. The first parameters are used in the studies of equitable colorings and decomposition of graphs. Z. Guo, H. Zhao, Y. Mao found the exact values of equitable vertex 2-arboricity of balanced complete tripartite graphs except when the size of each partite is divisible by 20. This project finds a generalization of their results. More precisely, the project finds the exact values of equitable vertex 2-arboricity for all complete bipartite graphs and tripartite graphs.

The second parameter is of much interest in study of game coloring. There are many researches finding some bounds for game coloring numbers of planar graphs with various girths. For upper bounds, the planar graphs with girths 4, 5, 6, and at least 8 are studied. For lower bounds, the planar graphs with girths 4 and 5 are studied. This project finds the exact values for game coloring numbers of the game coloring numbers of planar graphs with girth 7 and 8.

Keywords: vertex k-arboricity, complete bipartite graphs, complete tripartite graphs, game coloring numbers, planar graphs, girth