Discrete Mathematics Seminar

Time: Friday, 18 September 2009, 1:00–2:00 PM

Location: 238 Derrick Hall

Title: Exploring The Bounds On The Domination Number Of Permutation Graphs

Speaker: Kirsti Wash, Mathematics Department

Abstract:

For any permutation α on the vertex set of a graph G, the permutation graph $P_\alpha(G)$ is obtained from two copies of G, G and G', by joining $u \in V(G)$ and $v \in V(G')$ if and only if $\alpha(u) = v$. Let $\gamma(G)$ be the domination number of G. It has been proven that for all permutations α on any graph,

$$\gamma(G) \leq \gamma(P_\alpha(G)) \leq 2\gamma(G).$$

In this presentation, we focus on investigating the following:

1) Is it possible to classify certain graphs for which $\gamma(P_\alpha(G)) = 2\gamma(G)$ for all permutations α on $V(G)$?

2) If given two positive integers a and b, where $a \leq b \leq 2a$, is it possible to find a graph and a permutation on $V(G)$ such that $\gamma(G) = a$ and $\gamma(P_\alpha(G)) = b$?

3) Is is possible to classify the graphs for which $\gamma(P_*(G)) = \gamma(G)$, where * is the identity permutation?

This is joint work with Dr. Gu and two high school students (Millie Shi and Max Wimberley) from Texas State University Math Camp in the summer of 2009.