

# VCU Discrete Mathematics Seminar

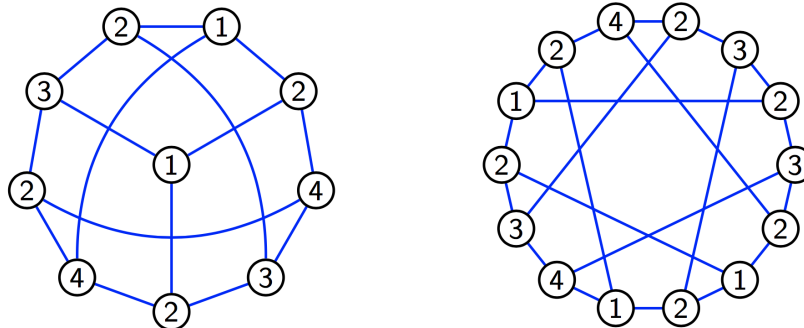
## *Distinguishing Chromatic Number of Graphs with Girth at least 5*

**Prof. Dan Cranston**  
**VCU!**

Wednesday, Nov. 7

1:00-1:50

4145 Harris Hall



A coloring of a graph (not necessarily proper) is an assignment of integers to its vertices. A coloring of a graph  $G$  is *distinguishing* if the only automorphism of  $G$  that preserves all colors is the identity map. The *distinguishing number* of a graph  $G$  is the minimum number of colors in a distinguishing coloring. The *distinguishing chromatic number*, denoted  $\chi_D(G)$ , is the minimum number of colors in a distinguishing coloring that is also a proper coloring. It is easy to prove that  $\chi_D(G) \leq 2\Delta(G) + 1$  for every connected graph  $G$  and  $K_{t,t}$  shows that  $2\Delta(G)$  colors may be necessary. Collins and Trenk conjectured that if  $G$  is connected with girth at least 5 (and  $G \neq C_6$ ), then  $\chi_D(G) \leq \Delta(G) + 1$ . We prove this conjecture.

For the DM seminar schedule, see:

<http://www.people.vcu.edu/~dcranston/DM-seminar>