Pi Mu Epsilon
& Gamecock Math Club

Student Seminar

Sudoku and Graph Theory: Critical Sets

Prof. Josh Cooper

USC Department of Mathematics

A Sudoku board consists of a 9 by 9 grid of "cells", in which each column, row, and "block" (one of nine 3X3 subgrids that tile the board) has each of the numbers 1 through 9 exactly once. A Sudoku "puzzle" is a partially filled-in board, and a "fair" puzzle is one that can be completed in exactly one way. Mathematicians have become interested in the question of what sets of cells can constitute fair puzzles; in particular, very strong evidence exists that the the fewest number of cells in such a puzzle is 17, but there is not yet a rigorous proof of this claim. It turns out that the question of the size of the smallest fair puzzle can be translated into a nice question about so called "critical sets" in general graphs – aka networks – about which a growing literature exists. We discuss some of what is known about critical sets, and present several unsolved problems about them.

Tuesday 4th February 2014

6:00 pm

LeConte 412

followed by a Sudoku Championship

								1
					2		3	
		4			5			
							5	
					4	6		
	1	7		8				
				1				7
	2		9					
5						4		

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