This Week's Mathematics Colloquium

Title: Graph Coloring and Kempe's Legacy
Speaker: Emily Moore, Grinnell College
Time: Tuesday, February 24th, 1:30 pm - treats at 1:15
Place: SC 182

This Week's Colloquium

The most famous graph coloring problem is the Four Color Conjecture, which states that every planar graph can be properly colored using no more than four colors. We will trace the history of this problem and examine why Kempe's proof of this conjecture didn't work. (His proof stood for eleven years, so the mistake is subtle!) Finally we will borrow a part of Kempe's technique that does work to look at new results in graph coloring extensions.

Emily Moore has taught mathematics and computer science at Grinnell College for 23 years. She has been active in the Iowa Section of the MAA, serving as its chair in 1994-95. She has published papers in graph theory and difference sets -- two areas of combinatorics with interesting real world applications.

Some Thoughts About Math

"A mathematician, like a painter or a poet, is a maker of patterns.   If his patterns are more permanent than theirs, it is because they are made with ideas."

-Godfrey Harold Hardy, *A Mathematician's Apology*

"Number is therefore simply the unity of synthesis of the manifold of a homogeneous intuition in general, a unity due to my generating time itself in the apprehension of the intuition."   *(Ahh… how true!)*

-Immanuel Kant, *Critique of Pure Reason*

"The good Christian should beware of Mathematicians and all those who make empty prophesies. The danger already exists that the Mathematicians have made a covenant with the Devil to darken the spirit and to confine man in the bonds of Hell."

-Saint Augustine

"A mathematician is a blind man in a dark room looking for a black cat which isn't there."
> -Charles R. Darwin

"He is unworthy of the name of man who is ignorant of the fact that the diagonal of a square is incommensurable with its side."
> -Plato

"Mathematics, rightly viewed, possesses not only truth, but supreme beauty -- a beauty cold and austere, like that of sculpture, without appeal to any part of our weaker nature, without the gorgeous trappings of painting or music, yet sublimely pure, and capable of a stern perfection such as only the greatest art can show."
> -Bertrand Russell, *The Study of Mathematics*

Last Week's Problem

A carnival worker offers you the opportunity to play the following game. Laid out in front of you are nine tiles, bearing the digits 1 through 9. The two of you will take turns selecting a tile. If either player collects exactly three tiles whose digits add to 15, that player wins immediately. You are offered the choice of going first or second, just because the carny likes your face. Is there a strategy you can employ to be sure of winning the giant plush Gorilla?

Philip Schulte '06 and Chris Ebert '06 sent a wonderfully detailed solution covering all possible cases. They will kick themselves when they read this... (from Heather Wood '07).

Sadly, there is no guaranteed way to beat the carny at his game and win the gorilla. Think of the numbers 1-9 placed in a magic square so that the sum of each row, column, or diagonal is 15.

8	1	6
3	5	7

4	9	2

Given this magic square, to win the game you must collect three numbers that form a row, column, or diagonal together before he does. Oh, wait - this looks familiar... it's TicTacToe!!! As we all know, there is no opening move in tictactoe to ensure victory, although choosing to go first and picking 5 (the center number) would help... however, I don't think the carny will be clueless enough to choose 1, 3, 7, or 9 (if he doesn't choose a corner it's possible to win; otherwise, it's a tie).

Ah, well. We all knew those games were rigged...

Problem of the Week

What is the smallest number of 2s required to make the number 2004? For example, we have $2004 = 2222 - 222 + 2 + 2$. So at most nine. What about 3s? 4s? ... up to 9s.

Please submit all solutions by Thursday at noon to David Molnar at molnar@stolaf.edu or by dropping them off at OMH 201.

If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at brakke@stolaf.edu.