St. Olaf Mathematics Department

Math Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

September 27, 2001
Volume 30, No. 2

This Week's Mathematics Colloquium

Title: Extended Interlacing Intervals
Speaker: Brenda Kroschel
Time: Thursday, Sept 27th, 4 pm
Place: SC 182

This Week's Colloquium

Brenda Kroschel is a graduate of St. Olaf in 1985 with majors in Mathematics and Chemistry. Brenda went on to get her Master's in Mathematical Sciences from Clemson University. After receiving her Master's Brenda worked as a computer programmer first at Control Data in Arden Hills and then for an Options and Futures' trading firm in Chicago. Brenda received her Ph.D. from William and Mary in Matrix Theory. She was a visiting professor for three years at Macalester College and is currently Assistant Professor at the University of St. Thomas.

Her talk will explore some properties of eigenvalues. We will start with the basics look at a computer animation that illustrates the definition. This computer animation brings up many other questions that allow us to explore other properties of matrices and eigenvalues. The talk will conclude with a discussion of eigenvalue interlacing and some extensions of the basic interlacing idea.

Contest Season

The coming months bring plenty of opportunities for the Math Department to put its new popcorn popper to work. Math Contests! The first of these will our in-house exam, the Carlson contest. This is a team competition (groups of three) with prizes in two categories. (Students who have not taken a 200-level math course take the so-called "Calculus" exam, but there is some Calculus and some other stuff on each exam.) This contest will be held the week of October 15th. For your chance at fame and glory (and **cash money**) give the names of your team members, along with current math classes, to Prof. Molnar by {**October 10th**}.

November brings the Team Contest of the North Central Section of the MAA. This is also a team contest, with groups of (up to) three competing against teams from the U and other colleges and universities from Minnesota the Dakotas, and parts of Canada. More info forthcoming; for now you can view old contests at the NCS-MAA site at http://www.gac.edu/~hvidsten/maa/ .

The 62nd annual William Lowell Putnam Mathematical Competition will be held on December 1st of this year. (That is a Saturday.) Of the two or three thousand students nationwide who willingly spend six hours on a Saturday taking a math test, about half score zero. If that sounds like your cup of tea (or, if you don't like tea, we'll also have pizza) you must give your name to Prof. Molnar no later than {**October 10th**}. This is not a commitment, but as this is a national competition, you need to sign up if you want to take the test. We will have practice sessions this fall. Last year, several St. Olaf students earned positive scores; we have a promising returning team.

Game Night

Last Spring saw the First Annual St. Olaf Mathematical Games Tournament. (Guess who was responsible for this - Molnar.) The competition will be back in the Spring of 2002 with a better name. If you are interested in spending some study breaks this Fall playing games like Hex and Dots and Boxes, figure out which nights are good for you, and write to Molnar! Descriptions of some games are available at http://www.stolaf.edu/people/molnar/games, but we might play other games too, like Zertz. Faculty and staff too!

Announcements

St. Paul Companies coming on campus to interview for entry level Information Systems positions. We will be having an Information Session on Wednesday October 10th at 6:30 pm in Room 144 in Buntrock. The first round of interviews will be on-campus on October 25th. The CDC will have more specific information on the job description, qualifications, and etc.

Last Week's Solution

Last week's problem: Find (or show that there does not exist) a number such that, when the last digit is removed and placed at the front, the number is doubled.

Solution: This week's problem was solved by **Bob Hanson** (Chem), **Bob Bried** (ACC), **Paul Zorn** (Math), and students **Mike Zahniser** and **Jason Saccomano**. This is Mike's solution.

Any integer can be expressed in the form 10a + b, where a is an integer and b is a single digit. In this case, we want 2(10a + b) = b*10^n + a, where n is the (unknown) number of digits in a. Thus, 19a = b * (10^n - 2), so we need to find an n such that 19 | (10^n - 2). To find this n, do long division dividing 19 into 10000000... until the remainder is 2. When this happens, the quotient is 5263157894736842, and b = 1, so

52631578947368421 * 2 = 105263157894736842, which is close but not quite right. However, 105263157894736842 * 2 is 210526315789473684, which works.

Problem of the Week

Find all positive integers that are within 250 of exactly 15 perfect squares.

*** Please submit all solutions to Cliff Corzatt (corzatt@stolaf.edu) by noon on Friday.

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.

Editor-in-Chief: Bruce Hanson

Associate Editor: Beth Speich

MM Czar: Donna Brakke

Problem Editors: David Molnar, Cliff Corzatt

mathmess@stolaf.edu