St. Olaf Mathematics Department

Math Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

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This Week's Mathematics Colloquium

Title: Chaos, An Introducion
Speaker: Doreen Hamilton
Time: Thursday, Oct 11th, 4 pm
Place: SC 182

This Week's Colloquium

Doreen Dumonceaux Hamilton (aka Dr. D) received her B.A. in Mathematics from St. Olaf in 1993 after spending a semester in Budapest. She then moved out west to Montana State University in Bozeman, Montana where she completed her Ph.D. in 2001. Her emphasis of study is Dynamical Systems with an interest in Topology. Doreen is in her first year here at St. Olaf as a professor.

Chaos is a buzz word in many areas of science lately, but what does it really mean? What characterizes chaos? How is chaos represented in the real world? Doreen will explore these questions and more, bringing some measure of order to this area of inquiry.

Reminders

Individuals interested in taking the Putnam Exam this December must inform Professor Molnar of their intent by **October 10th** (**WEDNESDAY**) or there will be no exam for them. Practice sessions will start soon.

Registration for the Carlson Contests (two exams, one for those who have not yet taken a 200-level math course, one for those who have) is less formal. The contest however is **next week** so we would like to know who is interested in taking it, and on what evenings. This is a team contest, and there will be Smarties available for those who pre-register. What are you waiting for? Zip off an email to molnar@stolaf.edu today!

Announcements

Are you interested in being an actuary? If so, there is an opportunity for you to visit the Minneapolis office of Towers Perrin to learn more about the actuarial profession. The company is inviting students to their office on the night of October 16 from 4-7 pm, dinner included. If you wish to attend, your RSVP is due by October 9 (**IMMEDIATELY**) to Nicole Ceurvorst (952-842-5654) or ceurvon@towers.com. For further information (and directions) please contact Mike Kahn at kahn@stolaf.edu.

Would you like to have an effect on kids' lives? Why not consider being a mentor? Educational Talent Search and GEAR UP! still need about 30 more mentors. The time commitment is about 30-60 minutes each week, correcting essays and writing letters to your mentee. For further information please contact Julia Seper at x8441 or visit www.stolaf.edu/services/ and click on ETS or GEAR UP.

Last week's colloquium, "All Hex Breaks Loose" was a great success and all involved had fun traipsing about on the outdoor gameboard by Buntrock to the musical stylings of Peter Hamlin. The board is still out there if anyone is up for a game. ☺

Last Week's Solution

Last week's problem: (1995, B5) A game starts with four heaps of beans, containing 3, 4, 5, and 6 beans. The two players move alternately. A move consists of taking **either**

a. one bean from a heap, provided at least two beans are left behind in that heap, **or**

b. a complete heap of two or three beans.

The player who takes the last heap wins. To win the game, do you want to move first or second? Give a winning strategy.

Solution: The key to solving this game lies in mentally breaking the game up and considering each heap as a separate game. The first player would win in a game played with a single heap of 3 or 5 beans; the second player would win with 4 or 6. The latter two piles can be set aside in your mind; you need take only from one of those piles when your opponent does. The only possible move from the pile of 5 is to reduce it to 4; you don't want to do this, lest your opponent remove the pile of three entirely. Vice versa, you don't want to remove the pile of three entirely. This leaves removing one bean from the heap of three as the only viable option. This is the winning move, found by **Paul Geigler**, but his strategy didn't quite work. It can be shown that, making this proper first move, you can win by keeping the number of heaps of size 3 even, *and* keeping the number of heaps of size 2 or 5 even. **Michael Zahniser** had the first of these criteria, but not the second. The problem can also be solved using nimbers.

Problem of the Week

Sven and Ole stand at opposite corners of a rectangular field, 8 rods in length by 1 rod. Along one of the long edges of the field runs a river of chocolate syrup, along the other a river of milk. According to custom, each must cross the field to retrieve the liquid from somewhere on the other side, and then the two will meet somewhere in the middle of the field and make chocolate milk. When Sven and Ole meet, the total distance they have traveled turns out to be the minimum possible. This is the square root of what integer?

*** 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.

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