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: Signal Processing, Business Cycles, and Inventory Management
Speaker: Glen Castore
Time: Tuesday, September 24th, 1:30 pm
Place: SC 182

This Week's Colloquium

The electronics industry experiences severe business cycles every 2 to 4 years. These swings lead to sizeable problems with inventory control and working capital. This week's talk describes the development of a time series model for giving advance warning of the changes in climate within the industry.

Glen Castore is a former Vice President of Operations for CyberOptics Corporation, a Minneapolis-based company which supplies optical sensors and inspection systems to manufacturers of electronics. He received a BA in mathematics from Swarthmore College in 1969 and a Ph.D. in mathematics from Syracuse University in 1981.

Cash In Your Math Skills!

St. Olaf's annual mathematical problem solving contest, the Carlson Contest, will take place Tuesday Sept. 24 and Wednesday Sept. 25.

First-year students are eligible to take the so-called "Calculus" contest, which has no Calculus on it. In fact, most of the problems on both versions of the test require no higher mathematics, and are similar to the Math Mess problems. The problems are designed to be fun, surprising, and to encourage teamwork.

Teams of up to three students who can find their way to the fireplace area outside OMH 100 between 4 and 7pm Tuesday or Wednesday can pick up copies of the test to be returned within 1 1/2 hours for first-years or 2 hours for upperclassmen, who receive a different set of problems. The top scorers for each version of the test receive $35 per team member, 2nd place $25, and 3rd place $15. Popcorn, soda, and other thought-provoking refreshments will be available. Interested students looking for teammates should email David Molnar (*molnar@stolaf.edu*), or just show up at 6:00 and see who is there.

Meet the Newcomers

Last week's issue of the Math Mess introduced you to the newcomers in the department. Now we give you a deeper analysis of these lively $\Re^3$ objects.

Steve Hamilton, new this year, earned his M.S. in Mathematics from Montana State University. When not teaching, Steve works as a computer consultant and cares for his sons, Benjamin and Andrew. These fine young men are also the sons of *Doreen Dumonceaux Hamilton*—herself the daughter of a mathematician and member of our section—who joined our department last year. Doreen graduated from Saint Olaf, and completed her PhD in 2001 at Montana State, in dynamical systems.

A recent graduate of that college across the Cannon River, *Matthew Bloss* has returned to Northfield to join our faculty. Matt earned his PhD under Georgia Benkart at the UW-Madison; he is delighted to return to his liberal arts roots. He looks forward to working closely with undergraduates and to exploring links among mathematics, the arts, and other fields.

Upcoming issues of the Math Mess will offer more analysis of the real (yet complex) lives of faculty newcomers.

MAA National Membership

This year the St. Olaf student MAA will be officially recognized as a national chapter. This means that there are two levels of membership in the St. Olaf MAA: first, you may participate in St. Olaf MAA events without being a national member yourself; second, you can become an official member of the national MAA! The standard fee is $20, but the math department is generously offering to pay half your bill. So for only $10 you can receive all the benefits of MAA membership—free journal subscriptions, opportunities to present research, and the chance to be part of a larger community. Contact Doreen Hamilton (OMH 303) for more information and application materials.

Last Week's Problem

Many different proofs are possible. We received correct solutions from *Michael Zahniser* '04 and *Jason Saccomano* '05.

Examination of the problem with fewer stones (2, 3, 4, ...) shows that the sum is always a triangular number (1, 3=1+2, 6=1+2+3, ...). 300 is a triangular number. So why does the pattern continue?

Imagine that there are invisible bonds between every possible pair of stones. When two stones are separated into different piles, their bond is broken. How many bonds are broken when we split a pile with m+n stones into a pile with m and a pile with n? Their product, mn. The number of bonds to begin with is 1+2+3+ ... + 24 = (25)(24)/2 = 300, and every bond must eventually be broken, so the sum of the products is 300.

Problem of the Week

How many consecutive 9s are there after the decimal point in $\left(4+\sqrt{15}\right)^{1,000,000}$?

** Please submit all solutions to David Molnar (molnar@stolaf.edu) by noon on Sunday.

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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