Math Mess

This Week's Mathematics Colloquium

Title: 6174 and More

Speaker: Robert Dumonceaux

Time: Thursday, March 7th, 2 pm

Place: SC 182

This Week's Colloquium

Dr. Robert Dumonceaux (a.k.a. Dr.D the Elder) is a professor of mathematics at St. John's University in Collegeville, MN. He received his Ph.D. with a concentration in Statistics from the University of Missouri-Rolla. His talk entitled, "6174 and More" is a discussion of the rich mathematics that arise from the simple subtraction problem: Take any n digit number. Order the digits in descending order and then subtract from that the number obtained from ordering the digits in ascending order.

For example: f(2002)=2200-0022=2178. If this process is repeated again ($f^2(2002)$=f(2178)=8721-1278=7443) and again..., what happens?

In the spirit of mathematical research, come ready to look for patterns, ask questions, and be surprised by the results of an in depth analysis of this process. This is a great example of what a mathematician thinks about while sloppin' hogs, gardening, watching his seven children compete in sports, and driving to Northfield to visit his grandchildren.

Career Column

Career of the Week: Cryptanalyst

A cryptanalyst solves cryptograms (writings in code) and designs cryptographic systems (methods for encoding and decoding messages). Traditionally, cryptanalysts dealt with understanding encoded messages sent by enemies and designing coding systems to keep their own country's communications secure. Modern cryptanalysis includes any type of hidden information such as telecommunication protocols. Cryptanalysts use mathematics, computer programming, engineering, and language skills.

Cryptanalysis is one of the job opportunities for mathematicians at the National Security Agency, the country's largest employer of mathematicians. For more information about job opportunities for mathematicians and computer scientists at NSA, visit www.nsa.gov. NSA also has summer internships for college students. Application deadlines for this year are past, but check program descriptions and deadlines for next year. While at the site, take a tour of the National Cryptologic Museum!

MAA T-shirts

The MAA is still taking designs for this year's t-shirts. You can turn designs in to the Math Department Office until Monday, March 11th. We know that there are some aspiring artists out there, so let's see what you can do!

Indoor Games

We had fun playing Outdoor Hex last fall, but until it warms up a bit, why not try the indoor variety? Yes, there's Indoor Hex too! Along with Dominono, Toroidal Sprouts, and Chomp, it will be part of our indoor games contest this Spring, currently titled "Name This Contest". The games will be introduced at Problem Solving night Wednesday March 20th (7 to 9pm in SC182). If you can't wait that long, check out http://www.stolaf.edu/people/molnar/games/namet hiscontest

Last Week's Solution

Last week's problem: In a recent newspaper column, Molly Ivins wrote as follows:

... The wealth of the Forbes 400 richest Americans grew an average $1.44 billion each from 1997-2000, for an average daily increase of wealth of $1,920,000 per person. That's 6,602 times the U.S. minimum wage.

At first glance, these numbers seem fishy. For instance, dividing $1.44 billion by 1095 (the number of days in 3 years) gives about $1,315,000 per day, not $1,920,000. But (fairly) good sense *can* be made of all these numbers if we interpret things correctly and if we correct one tiny mathematical/typographical error (it involves a missing digit).
Make sense of the numbers.

Solution: There were several solutions submitted, but only **Luke Anderson** (a double major with econ) had a complete solution. Here it is, short and sweet:

1) Molly Ivins used BUSINESS days, not total days, over the three-year period. The number of business days per year is 250, after you remove weekends and national holidays. So, it's $1.44 billion / 750.

2) The number 6,602 should have been 46,602. $1,920,000 / 46,602 is $41.20, which is the 8-hour daily wage of someone making $5.15 an hour, minimum wage.

Problem of the Week

This week's problem is from a new book by Miklos Laczkovich, entitled "Conjecture and Proof". The book grew out of a course of the same name in the Budapest Semesters program.
A *Sidon sequence* is a sequence of positive integers where all of the sums a+b, for any a and b in the sequence, including the case a=b, are different. Find the longest Sidon sequence of numbers ≤ 63.

** 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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