This Week's Mathematics Colloquium

Title: "The (Infamous) Problem Guys Show"
starring Cliff Corzatt and Dave Molnar
Time: Thursday, October 9th, 2:30 pm - treats at 2:15
Place: SC 182

Banned in 49 States!

After a very popular 50-year hiatus, the Problem Guys return to the only place that would have them for their annual problem-solving revue, and boy do they have problems! The New York Times called *The Problem Guys Show* "a disgusting melange of tired techniques such as pigeonhole principle, coloring proofs, and invariants, hastily thrown together with no regard to human decency." The ACLU tried to shut them down, claiming the pigeons were being denied their civil rights. Marilyn Manson kicked them off his tour, saying their act was in bad taste and in need of moral guidance! Yet these brave pioneers carry on with their single-minded purpose -- to explain problems from the Carlson contest, reveal methods for arriving at beautiful solutions, and articulate the underlying themes commonly seen on such contests. Leftover potato salad and chocolaty syrup from last week's tailgate party will be served.

The Carlson is Coming

Are you geared up for the Carlson? The Contest will be held this Tuesday and Wednesday, Oct. 7 and 8, and the problems can be picked up in the area just down the steps from SC188 any time between 2:30

and 7:00 pm on Tuesday or between 3:30 and 8:00 pm on Wednesday. Teams will have 2 hours to do the problems and return their solutions. So get your team (up to three people) ready, and score some dough! If you have any questions, email molnar@stolaf.edu (subject: Carlson) and he'll give you the scoop.

Attention Seniors!

Seniors, you know you're going to have to look for a job; here's an easy and worthwhile way to do something about it for merely an hour next Wednesday.

The tech job market is finally opening up again – at least at Target Technology Services (TTS), the computing arm of Target Corporation. TTS is looking for seniors in **CS, Math**, and/or **Statistics** who are interested in working at a top company (Fortune 25) that cares about people (listed as a top 100 Corporate Citizen) in their powerhouse technology department. Moreover, they're looking specifically for *St. Olaf* seniors!

On Wednesday (10/8) at 7pm, TTS will present on working for Target in general and about a special "fast track" career route in TTS that they would like

to make available to about a dozen Ole seniors. We've had companies make October recruiting presentations in the past, but we seldom have a major employer come specifically to recruit St. Olaf seniors for a special job track. This is truly a great opportunity, and even just coming to the presentation is a positive step towards a rewarding career. For more information, see CEL or Professors Brown, Richey, or Humke.

What:	Target (Technology Services) Information Session
Who:	Kevin Casson '89 and friends
Date:	Wednesday, October 8, 2003
Time:	7-8 pm
Where:	Buntrock 144

And the Winner Is…

Emily Weninger walked away from last Tuesday's baseball talk with the prize for the coin-flipping contest: a baseball autographed by almost all of the faculty. Emily's unique sequence of flips was 'TH'. As to why Emily wins so many colloquium prizes, it is rumored that there are actually two Emily Weningers...

The Putnam is Fun

The 64th annual William Lowell Putnam Mathematical Competition will be held on December 6, 2003. This contest is open to all undergraduate students in the US and Canada. The median score for the competition is usually zero, though last year St. Olaf placed four students in the top 1000 overall. The contest runs from 9 to 12am and 2 to 5pm, with pizza and rampant geekiness between. This is a national contest - if you want to participate, you actually have to **sign up**! Let Molnar know via email **by October 10th** if you are interested. Copies of old exams are available.

Last Week's Problem

What is the smallest number with exactly 1001 positive factors? Is this the same as the smallest number with *at least* 1001 positive factors?

The basic version was solved by **Mathias Hunt '07**, **Joey Paulsen '07**, and **Paul Tveite '07**, (all of whom trained for ARML under Wayne Roberts up at Mac this Spring), **Chris Ebert '06**, and **Senator**

Zorn. To find how many factors a number has, look at its prime factorization. If $n = 2^a \cdot 3^b \cdot 5^c \cdot 7^d \cdot ...$, then it has $(a+1)(b+1)(c+1) \cdot ...$ factors, since you can choose any exponent from 0 to a for the 2, 0 to b for the 3, etc. So: $1001 = 7 \cdot 11 \cdot 13$; $3,779,136,000,000 = 2^{12} \cdot 3^{10} \cdot 5^6$ has exactly 1001 factors. (There are other numbers with 1001 factors, but this is clearly the smallest.) For the second part, Paul, Joey, and I all came up with 245,044,800, which is $2^6 \cdot 3^2 \cdot 5^2 \cdot 7 \cdot 11 \cdot 13 \cdot 17$, so has 1008 factors. This was the smallest any of us could come up with, an improvement on Zorn's $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17 \cdot 19 \cdot 23 \cdot 29$, which has 1024 factors, but is much larger.

Problem of the Week

For each positive integer n, define a(n) to be the number of j between 1 and n inclusive such that 2^j starts with the digit 1. Find $\lim_{n \to \infty} a(n)/n$. That is, find the fraction of powers of two which start with 1.

*** Please submit all solutions by Wednesday at 5:00pm to David Molnar by e-mail <molnar> or by placing them in his box 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.

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