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: Proofs, Damned Proofs, and Mathematics
Speaker: George Gratzer
Time: Thursday, Oct 25th, 2 pm
Place: SC 182

This Week's Colloquium

What is a proof?
- Is a proof absolutely true?
- Can you write down a complete proof?

Is mathematics = proofs?
- Do mathematicians = proofs?

What is the difference between proving and problem solving?
- How can you tell if you can do proofs?

How to learn a proof.
- One idea to remember.
- Can you learn in a group?
- How can you tell if a proof is easy?
- What to do about "therefore"-s, "it follows easily"-s, etc.

Can you learn math by discovering all the proofs?

Is there math without proofs?

George Gratzer did a lot of proofs in more than 200 published papers and a pile of books. His specialities are lattice theory and universal algebra, branches of modern algebra. When he's not doing research, he likes to write about mathematical typesetting; his books are used world wide by some 30,000 mathematicians.

Professor Gratzer is a member of the Royal Society of Canada and an external member of the Hungarian Academy of Science.

His hobbies include reading, classical music, digital photography and movies. He also plays chess, go, and bridge--badly.

Fermat Revisited

Ed Pegg, Jr. of mathpuzzle.com is offering $200 for a solution to the Fermat equation

x^n + y^n = z^n, with n >=3, where x, y, and z are *Gaussian Integers* (numbers of the form a+bi, where and b are integers. These numbers form a *ring*, which you can learn about in Abstract Algebra.) Check out the site for more info.

☺ More Problem Solving!!! ☺

The North Central Section of the Mathematical Association of America is holding its team Problem Solving contest on **Saturday, November 10**. There is a variety of problems, with an overall level of difficulty similar to last week's Carlson. The competition is strong, with teams from nearby colleges, the U, and schools throughout the region. All are encouraged to participate, and practice sessions will be held. Interested problem solvers should send e-mail to **molnar**, preferably in teams of three (although we will also make an attempt to match folks up). So that we can get enough rooms reserved, please respond by **Monday, November 5**. There will be pizza!

Free Money and Food

Lutheran Brotherhood presents:
Your Money, Your Future: Take Control
Tuesday, Oct. 30th in the Pause, 7:30-8:30 pm
This is an interactive event for college students to discuss the influences on their financial habits, their financial challenges and ways to deal with financial issues. Nathan Dungan, vice president of marketing at Lutheran will lead the event, focusing on finding solutions that help students share, save and spend their money in ways that reflect their values. Lutheran Brotherhood will be giving away two $300 prize packages and there will be free pizza following the event.

Last Week's Solution

Last week's problem: A mouse crawls through a maze in the shape of an equilateral traingle divided (by straight lines parallel to the sides of the larger triangle) into 64 smaller triangles. There is a piece of cheese in the center of each of the smaller triangles. Once the mouse has visited a particular triangle, he will not visit it again, since it no longer contains cheese. What is the greatest number of pieces of cheese which the mouse can eat in a single continuous path through the maze?

Solution: This problem was conveniently also Carlson Contest problem #3. It was solved by **Jerad Parish**, **Paul Tlucek** and **Nick Maryns**.

If the mouse starts at the lower left corner (corners yield a maximum-length path) and works its way up to the top by going right until the triangle before the corner, then up, then left until the triangle before the new "corner"...etc... it must forsake a piece of cheese on every level except one (the second level before the top, it can go out to the edge). since splitting the sides of an equilateral triangle into n equal parts yields n^2 smaller triangles, this means the general solution is a maxmimal path length of n^2-(n-1), or in the case where n=8, 8^2-(8-1) = 57.

Problem of the Week

Prove that the equation

x^4+y^4+z^4-2y^2z^2-2z^2x^2-2x^2y^2=24
has no solutions in integers (x,y,z).

*** 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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