

The Almagest

The bi-weekly newsletter of the Department of Mathematics and Computer Science. Your trusted source for news.

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Alma College
Alma, MI 48801

Math Colloquium – October 22nd

The equation $f(x+y) = f(x) + f(y)$ describes functions which “commute with addition,” a condition that arises naturally in a variety of contexts in pure and applied mathematics. In the 1820's, Augustin Louis Cauchy undertook the simple, natural, and surprisingly difficult task of classifying all solutions to the equation. The full solution to this problem took another century and required input from mathematical heroes ranging from Banach to Lebesgue to Sierpinski. In this talk, **Dr. David Gaebler**, Assistant Professor of Mathematics at Hillsdale College, will recount the twists and turns of the Cauchy equation over the centuries; along the way, we will encounter some topology, measure theory, and even axiomatic set theory. Buckle your seatbelt for a wild ride through the real number system and its infinite possibilities!



*“The Cauchy Functional Equation:
A Simple Question with a Complicated Answer”*

Presenter: **Dr. David Gaebler**
Date: **Thursday, October 22nd**
Time: 4:00
Place: SAC 113

Refreshments at 3:50

Math Help Center

Monday – Thursday, 7-10 pm in Dow L2

Important Meeting for Seniors

All senior math and computer science majors, who intend to graduate this year, are required to attend a meeting on **Thursday, October 15th** at 4:00 in SAC 216. At this meeting we'll provide details about the MFAT as well as the written and oral components of the senior comprehensive.

MATH Challenge on November 7th

You are invited to participate in the 21st annual MATH Challenge, held on **Saturday, November 7th**. The **MATH Challenge** is a *team-oriented*, 3-hour exam consisting of ten interesting problems dealing with topics found in the undergraduate math curriculum. Teams consist of 2 or 3 students, and you'll take the exam on campus from 9:30 am to 12:30. You may form your own team or you can simply be placed on a team. Before the exam, you'll be provided with a “hearty breakfast” of waffles, bagels, donuts, and juice. If you're interested, contact Professor Sipka.



The Math Club

The Math Club meets **EVERY TUESDAY** at 9:00 pm in Dow 132.

Please come.
Everyone is welcome!



Applying for REUs and Grad School

In light of last week's math colloquium, "Our Summer Research Experiences," it seemed appropriate to do a follow-up article on the application process. Even though we're busy with midterms, it's still important to keep in mind what opportunities are available to you outside of Alma College. So here are a couple of tips on how to get started with the process and keep yourself organized and motivated as you work through it:

1) **Start researching now!** Your profs are a great resource, so be sure to talk to them about what your interests are and see if they have any advice on where you can pursue your interests. For those interested in math REUs, I recommend: <http://www.ams.org/programs/students/emp-reu>.

2) **Keep the information organized!** As you start finding programs that interest you, record them. Put them on a piece of paper or in an Excel document along with as much information as you can find about the application process (deadlines, application requirements, etc.).

3) **Ask for letters of recommendation EARLY!** Be sure you give your profs a minimum of 3 weeks notice for writing a letter. Also, when asking for a letter make sure to provide a short resume along with a list of the programs to which you're applying. And let them know about the DEADLINES for letters. This gives your recommender plenty of information.

4) **Ask questions!** You will most likely find points of confusion as you are looking at requirements for various REUs and grad schools. Do not hesitate to contact those in charge.

5) For Seniors interested in graduate school: you must take both the general GRE and subject GRE in math.

Best of luck to all of you on your searches and midterms! If this article happened to stress you out by increasing your to-do list, take a moment to relax with this comic about Harry Potter and Set Theory: <http://existentialcomics.com/comic/98>

Jacob Blazejewski

Solution to the Previous Puzzle

Say you have three sacks. Two contain gold coins. The third contains fake coins. Each real coin weighs one ounce. The fakes weigh 1.1

ounces. You have a digital scale. With ONE weighing, how can you tell which sack has the fake coins?

Within a few hours after the problem was posted, first-year student **Brian May** offered the following solution: Select 1 coin from sack 1, 2 coins from sack 2, and 3 coins from sack 3; weigh the 6 coins. If weight = 6.1, the fakes are in sack 1; if weight = 6.2, the fakes are in sack 2; if weight = 6.3, the fakes are in sack 3.

Minutes later, **Jack Regan**, another first-year student, submitted a similar solution.

Puzzle of the Bi-week

Suppose f is a polynomial of degree SIX such that $f(n) = \frac{1}{n}$ for $n = 1, 2, 3, 4, 5, 6, 7$.

FIND $f(8)$. NOTE: The answer is **not** $\frac{1}{8}$.

Hint: Consider the polynomial g defined as $g(x) = x \cdot f(x) - 1$.

A prize of **\$2.00** will be awarded to the 1st student who submits a correct solution to Prof. Sipka.

Student assistants: Christine Wiersma/Jacob Blazejewski
Faculty advisor: Tim Sipka
Distribution: Deb Smith

If you would like to submit an announcement or a short article, please send it via e-mail to Tim Sipka (sipka@alma.edu).