

The Almagest

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

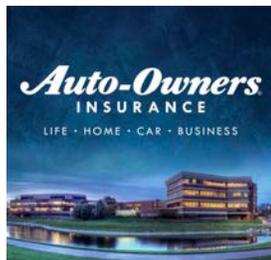
Volume 11 No. 3

October 8, 2018



Next Colloquium – Wednesday, Oct. 17th

Our next colloquium will be a joint presentation by two of our senior majors, **Ben Elliot** and **Eric Ferrara**. This past summer Ben and Eric had internships at Auto-Owners Insurance in Lansing. Eric, a mathematics and physics double major, worked in the Actuarial department, where he was a part of an Actuarial/Loss Reserving team whose goal was to set up a new system. Ben, a computer science major, worked in the Underwriting Modernization department, where he created a dashboard for database logs and wrote software that allowed two programs to talk to each other. Both Eric and Ben will begin their new jobs at Auto-Owners after graduating in April.



“Our Summer Internships at Auto-Owners”

Date: **Wednesday, October 17th**
Time: 4:00
Place: SAC 113

Refreshments at 3:50.

Remaining Math & C.S. Colloquia

Oct. 29: “Rook Placements” **Dr. Kenneth Barrese**

Nov. 15: “Decision Analysis & Cost-effectiveness Modeling” **Ms. Stacey Kowal (IQVIA)**

Nov. 26: “Curiosities and Counter-intuitive Notions in Mathematics” **Prof. Tim Sipka**

All talks begin at 4:00 in SAC 113.

Math Challenge – November 3rd

You are invited to participate in the 24th annual MATH Challenge, held on **Saturday, November 3rd**. 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 pm. 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.



Math Club

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

Please come.
Everyone is welcome!



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 11th** 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.

Zipf's Law: An Interesting Phenomenon

Nearly 70 years ago a man by the name of George Zipf made a curious observation. After ranking words by popularity, a striking pattern was obvious. The word ranked number one in popularity was used twice as often as the word ranked second, and three times as often as the word ranked number three. This occurrence was initially called the rank vs. frequency rule.

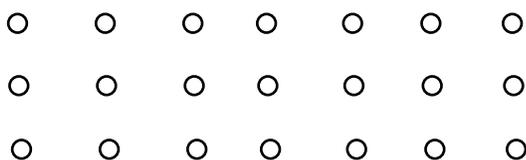


People have continued to study this phenomenon. A handful of websites have analyzed the contents of their webpages and found that Zipf's Law does indeed govern their web content. Others have studied the Zipfian distribution on subsets of language users and claim that it is universal in natural language. Children under 32 months of age, as well as specialized vocabulary found in university textbooks are marked by this distribution. Interestingly, it doesn't seem as though a concrete explanation of why this rule holds true has been found.

Zipf went on to find that this rule also described the income distribution of any given country. The richest person made twice as much as the next richest and so on. It was later found that this rule applies to the populations of cities in any given country. People have begun to ask how Zipf's Law might advance machine learning and predictive modeling. Time will surely answer this potentially world altering question. *Cheyenne Kalfsbeek*

Solution to Previous Puzzle

Each of the 21 dots in the array below is to be colored with one of two colors. **Prove** that, no matter how the coloring is done, there will be four dots of the same color that form the vertices of a rectangle.



There were no solutions (proofs) submitted for the previous puzzle. So, there is still a \$2.00 reward for solving this problem.

Puzzle of the Bi-week

Here's a problem that a calculus student should love:

$$\text{IF } \lim_{x \rightarrow a} [f(x) + g(x)] = 2 \text{ and}$$

$$\lim_{x \rightarrow a} [f(x) - g(x)] = 1,$$

$$\text{FIND } \lim_{x \rightarrow a} [f(x)g(x)].$$

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

Student assistant:	Cheyenne Kalfsbeek
Faculty advisor:	Tim Sipka
Distribution:	Jackie Gage SAC 224

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



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