**Bust out your problem solving cap, and register for the Putnam!**

Are you interested in taking part in a challenging problem solving competition? The sixty-ninth annual Putnam Competition will be held on Saturday, December 6. Even though December seems like it is well into the future, the registration deadline is very soon. We need to know by **Monday, October 5**, if you would like to participate. Also, because this event occurs over winter break, we need to arrange for you to actually take part at a nearby college or university. There is no fee for participating; the only cost to you is a Saturday during break. In order to register, simply e-mail Gail Nelson the name of the school nearest your winter break location. Questions? See Gail for more details.

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**Across the River**

As part of St. Olaf College’s dedication celebration for their new science complex, the traveling exhibit the “NASA Vision for Space Exploration Experience” will be open to the public in the Melby parking lot through **October 4th**. The exhibit includes a simulated visit to the moon, and a theater experience introducing the visitor to NASA’s plan to return to the moon.

**Got Mathematica Skills?**

Mathematica is a powerful tool for today’s mathematician. Being proficient in Mathematica may help you finish your problem set, but that’s not all, those same skills may help you secure a job. The Mathematica Student Certification Program has been created to help you do just that, taking and passing the Certification test, you can receive official recognition for your Mathematica prowess. To take the test you will need a faculty sponsor. For more information, e-mail: certification@wolfram.com. To register go to: http://www.wolfram.com/services/certification/register.cgi

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**The Gazette Goes Electronic**

There are big changes for the Gazette this week. Instead of in their mailbox, subscribers to the Gazette received it in their inbox. That's right, the Gazette is now being primarily distributed electronically. Worry not, no matter the format, the Gazette will always be your source for mathematical news on campus.

**Seen at the CMC**

Join us as we get to know some of these newest additions to the CMC community. Last week we sat down with Sue Jandro, this week, Tim Sipka.

Tim Sipka, visiting professor from Alma College in Michigan joins us for the fall. While here on his sabbatical, Tim is not only teaching Calculus, he is also taking the time to observe some of our classes. When he’s not busy with classes or office hours, Tim can be seen with his wife exploring the Twin Cities and the coffee shops of Northfield.
Looking North

The North Central Section of the Mathematical Association of America has two meetings each year, and one of them is just around the corner: October 17-18 in Moorhead. Students are more than welcome!

Opportunities for Carls

What are you doing winter break? Next year? After you graduate? Now is the time to start exploring your opportunities. Here are a few to consider:

The College of Engineering at Purdue University wants you to know about its graduate programs, check out their poster on the second floor hallway of the CMC.

The Stephen M. Ross School of Business at the University of Michigan is looking for motivated students with a strong mathematical background for its doctoral program in Operations and Management science for work modeling business situations using rigorous mathematics. To learn more about the program go to: http://www.bus.umich.edu/Academics/Departments/OMS/OMS/

Interested in doing winter-break scientific research at Carleton or another institution? Consider the Robert J. Kolenkow and Robert A. Reitz Fund for Undergraduate Research. This new fund, created by a donor honors former Carleton professors Kolenkow and Reitz. Up to eight students in the natural sciences and mathematics will be supported over winter break 2008. This support may come in the form of a stipend, travel fund, housing, etc. Applications are due October 16. For more information go to: http://serc.carleton.edu/cismi/KolenkowReitz.html

Problems of the Week

1. Do there exist functions $f$ and $g$, both of which are defined and continuous for all real numbers, such that $f(g(x)) = 3x$ for all real $x$ and $g(f(x)) = 5x$ for all real $x$? If so, give an example of such functions; if not, prove that they cannot exist.

2. For vectors in $\mathbb{R}^3$, the cross product operation is not associative; that is, $(\vec{a} \times \vec{b}) \times \vec{c}$ is usually not equal to $\vec{a} \times (\vec{b} \times \vec{c})$. Is there any restriction at all on what the two “cross products of three factors” considered here can be? That is, given vectors $\vec{v}, \vec{w}$ in $\mathbb{R}^3$, are there always vectors $\vec{a}, \vec{b}, \vec{c}$ to be found for which $\vec{v} = (\vec{a} \times \vec{b}) \times \vec{c}$ and $\vec{w} = \vec{a} \times (\vec{b} \times \vec{c})$? If so, show why; if not, give an example of specific vectors $\vec{v}, \vec{w}$ for which no such $\vec{a}, \vec{b}, \vec{c}$ exist.

Last week’s first problem was solved by Tyler Mitchell, Danny Chen, and Sen Zhao, and by a consortium of solvers that included Dustin Anderson, Rebecca Cordes, Collin Hazlett, and Jonathan Hahn (within the consortium, I’m a little hazy on just who contributed to just what). Nice going, individually and collectively! Tyler should pick up a "C" block or other B.B.O.P. item from CMC 217. As for the second problem, there were good observations and serious attempts from the consortium, from Danny, and from Sen, but I'll need a little more time to sort out whether any of them is entirely correct - the arguments for uniqueness (to show that there can only be one function satisfying the given conditions) range from nonexistent to (apparently) a bit “fishy”. Press time is here, so more on this next week. Meanwhile, my own solutions to the problems posed September 19 have been posted in the hallway outside CMC 218. Good luck on the new problems!

- Mark Krusemeyer