Welcome Back to Winter Term!

**REU Application Season Begins!**

With the winter weather come plans for paid research in the brighter summer months. Research Experiences for Undergraduates, summer internships, and year-long opportunities all send their information to the Carleton Math department. Read the Goodsell Gazette this term for information on these programs—but feel free to do your own research too!

**Summer Internship with NASA**

The National Aeronautics and Space Administration is sponsoring a program called Motivating Undergraduates in Science and Technology (MUST). The summer internship provides both a stipend and a $10,000 scholarship. The deadline for applying is less than a month away, February 2, so be sure to check www.nasa.gov/education/must soon!

**Allianz Actuarial Internships**

Allianz is looking for interns who have passed at least one SOC/CAS exam; if you fit this description, or will soon, look for information at www.allianzlife.com.

**Study Abroad**

Lindsay Lohan once said in the movie Mean Girls that the reason she liked math was “because it’s the same in every country.” Regardless of your fillings for Ms. Lohan, she brings up a good point: now is a great time to start exploring your off-campus studies options in mathematics. Studying off campus can be a great part of your college experience.

The Budapest semester in Mathematics is a wonderful opportunity to study math with eminent Hungarian scholar-teachers. All classes are taught in English, and the school is located near the center of historic Budapest. Application deadline for next fall is April 30. Visit: www.stolaf.edu/depts/math/budapest.

For information about this and other study abroad programs see your professors, or the Office of Off-Campus Studies.

**Northwestern University Materials Science REU**

If you are interested in engineering and have experience in physics or chemistry, you might also be interested in this summer’s Materials Science REU at Northwestern University. The dates of the program fit the Carleton schedule and the stipend is generous. For more information, visit the program’s website: www.mrsec.northwestern.edu/content/education/ual_programs/reu.htm
PROBLEMS OF THE WEEK

1. Note that the integers \( a = 1, b = 5, c = 7 \) have the property that the square of \( b \) (namely 25) is the average of the squares of \( a \) and \( c \) (1 and 49, respectively). Of course, from this one example we can get infinitely many examples by multiplying all three the integers by the same factor, say to get \( a = 11, b = 55, c = 77 \). But if we don't allow this, can we still get infinitely many examples? That is, are there infinitely many triples \((a, b, c)\) of positive integers such that \( a, b, c \) have no common factors and the square of \( b \) is the average of the squares of \( a \) and \( c \)? (Show why your answer is correct.)

2. There are two entrances to the schoolyard at Wohascum High; one entrance is 50 yards due north of the school's front door, while the other is 50 yards due east. A few days ago, while Northfield had freezing rain, Lake Wohascum had a substantial snowfall, and afterward the high school custodian discovered, to his dismay, that the school's snow blower wasn't working. Faced with the task of shoveling paths from the front door to each of the entrances of the yard, he decided to first have a cup of coffee and consider whether there was any way to improve on 100 yards' shoveling. He did still need to end up with sufficient clear paths for students to be able to enter the schoolyard through either entrance and get to the front door without tracking through snow. What is the minimum distance the custodian had to shovel under these conditions, and how did he do it?

As promised, solutions to all problems posed last term have been posted in the hallway outside CMC 218. And as usual, solutions to the problems above that arrive (in my box in the CMC) by Tuesday evening will be acknowledged in next week's Gazette. Good luck, and stay warm!

- Mark Krusemeyer

MIT Summer Research Program

Massachusetts Institute of Technology has an application deadline of February 1 for its summer program, which is geared toward those groups traditionally underrepresented in the sciences and mathematics. In addition to conducting and presenting one’s own research under an advisor from MIT, students will take part in various cultural activities in the Boston area. For more information and to apply, check out their website at web.mit.org/odge/msrp.

Mathematician: the Best Job Ever?

Jobsrated.com has recently done a study of the “best and worst jobs” in the United States, and, of interest to math undergraduates everywhere, the top 6 jobs were:

1. Mathematician
2. Actuary
3. Statistician
4. Biologist
5. Software Engineer
6. Computer Systems Analyst

Perhaps some particularly pleased mathematicians rigged the study; the criteria used to rate the jobs certainly would affect the results. Jobs were rated on the bases of Environment, Income, Outlook, Stress, and Physical Demands. Stress and Physical Demands are negatives, which explains the absence of medical professionals in the top jobs. It also explains the worst-rated job (out of 200): lumberjack.

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