

Goodσελλ Gazette

Carleton College
Northfield MN 55057

The newsletter for the Carleton mathematics and statistics community

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Pizza Lunch on Friday!

Come join the Math Department for pizza at 11:11:11 on 11/11/11 in the math department lobby in the CMC!

MATCH Corps Positions

Gabe Davis, who graduated last year, advises current seniors to look into joining MATCH Corps, an 11 month (August through June) residential fellowship program. It pairs Corps members with 6-7 MATCH High or Middle School students. Corps members run small group or 1-on-1 tutorials every day, run extracurriculars, coach sports, and serve as a Teaching Assistant to one of our classroom teachers or as an Administrative Assistant in one of the school departments.

After their service year, Corps members go on to a variety of grad school programs (law, medicine, public policy, etc.); others will transition into social advocacy and non-profit work; still others will begin work in the private sector.

Those interested can contact Gabe at gabe.davis@matchschool.org.

Minnesota Space Grant Consortium Scholarships

Through its participation in the Minnesota Space Grant Consortium, Carleton offers MnSGC Scholarships up to \$1000 to students whose area of study and career goals are related to NASA's interests in space, space-related sciences, and engineering. Student applicants

must be registered full-time at Carleton and must be U.S. citizens. The application deadline is Nov. 28, 2011. More information and application instructions can be found at:

https://apps.carleton.edu/curricular/physics/for_students/Scholarships/MnSGCScholarship/.

UCLA Logic Center Summer School

UCLA's undergraduate summer school in Logic is intended to introduce future mathematicians to central results and techniques from mathematical logic. Courses are very intensive, yet do not require any background in logic. By the end of summer, students can expect to reach graduate level material. Topics include first order logic, Gödel incompleteness, forcing and independence in set theory, and non-standard analysis. Successful applicants will receive a \$3000 stipend, free housing at UCLA and up to \$500 in travel reimbursement. The school's dates are June 24 to July 14, 2012. To get more information and to apply, visit www.logic.ucla.edu. The application is due on February 26th.

Masters of Engineering at Cornell Univ.

Cornell University is offering a new graduate degree in Operations Research and Information Engineering (ORIE). Sub-specializations include Data Analytics, Financial Engineering, Applied Operations Research, Strategic Operations, Information Technology, Systems Engineering and Manufacturing. You do not need an engineering degree to apply. The application is due by December 1st, and can be found at www.orie.cornell.edu.

PROBLEMS OF THE WEEK

1. Consider those positive integers that are either a power of 2 or the sum of two powers of 2. The first few such integers are 1 (yes, we'll count that as the "zeroth" power of 2), 2, 3, 4, 5, 6, 8, 9, 10, 12, ..., so early on, most positive integers are on the list. However, in the long run, almost no integers are on the list, in the sense that the proportion of the integers between 1 and n (inclusive) that are on the list tends to 0 as n goes to infinity. Find the smallest value of n for which this proportion is less than $1/1000$; that is, of the integers between 1 and n , fewer than one in a thousand are either a power of 2 or a sum of two powers of 2, but this statement is no longer true if n is replaced by any smaller integer. (Note: This can possibly be done by "brute force" using technology to check every single value of n , but that's not the intention.)

2. a) Show that every polynomial (with real coefficients, in one real variable x) can be written as the sum of three cubes (third powers) of polynomials.

b) Show that not every polynomial can be written as the sum of two cubes of polynomials.

Last week's problems were both solved by Justin Troyka (who is in Budapest these days) and also by *Mathematica* maven John Snyder in Oconomowoc. With any luck, I'll get several weeks' worth of my own solutions posted this weekend. Because this is the last *Gazette* of the term, any solutions that arrive now will be acknowledged publicly in the first issue of winter term, although I'll try to do so privately before that. Good luck on exams and such, and have a great winter break!

- Mark Krusemeyer

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