Problem Solvers Win Fame (But Not Fortune)

In November three Carleton teams were among the 88 teams from around the region who competed in the annual NCS problem-solving contest; Carleton's teams consisted of Xin Chen and Matt Adams, Danny Chen, Li Shunji, and Sen Zhao, and Henry Luo, Wenzheng Chi, and Jerry Yang. The results of the contest came in after the last Gazette of the fall went to press, but we're thrilled to report that all three Carleton teams finished among the top twenty five teams. In fact, the team consisting of Danny Chen, Li Shunji, and Sen Zhao earned a perfect score, tying for first place with two teams from the University of Minnesota. Congratulations to all who participated!

In addition to its strong performance at the NCS contest, Carleton's problem solving group (affectionately known as CMC 328) appeared in print in November, when the American Mathematical Monthly published CMC 328's solution to a problem involving sums of binomial coefficients. This solution was one of just two published from among the several dozen correct solutions the journal received. Great work CMC 328, keep on solvin’!

Work with the Federal Reserve Bank of Boston

The Federal Reserve Bank of Boston is looking for bright undergraduate seniors to join their research assistant program. Research assistants would work with one or two economists in data collection, statistical and economic analysis, literature reviews and writing assignments. The research positions require a two-year commitment. After working at the Boston Fed, many past research assistants have gone on to attend prestigious graduate programs in disciplines such as economics, public policy. Applications will be accepted January 1 through February 15. E-mail RARecruit@bos.frb.org with questions. For more information or to submit your application, go to: http://www.bos.frb.org/economic/recruit

Program for Women and Mathematics

The Institute for Advanced Study and Princeton University are hosting a program to bring together female mathematicians from undergrads to post-docs. This year’s p-adic Langlands program will run May 17-28 at the Institute for Advanced Study campus. All participants will receive support for shared lodging, meals and transportation. Applications are due February 20. To apply, or for more information, go to: http://www.math.ias.edu/womensprogram
REU Opportunity at Oakland University

Oakland University’s department of Computational and Numerical Statistics and Mathematics wants you for their REU this summer. The program is open to all students, with the specific goal of enhancing career opportunities for women and other underrepresented groups in mathematics and statistics. At Oakland University’s REU students will work closely with faculty mentors in an area of computational mathematics, statistics, or algebraic statistics, and will work on an independent project over the eight week period. Students will be provided room and board and paid a stipend. Travel allowances, and further support to attend national conventions will also be available. For more information, go to: http://www.oakaland.edu/CaNSaM

Ph.D in Finance at Rice University

Just minutes from downtown Huston, Rice University is launching its first Ph.D. program in finance this coming fall, and they are looking for math majors who might be interested in applying their talents to the study of finance. Because their program is so new, they will be offering an extremely competitive stipend in addition to the usual waiver of all tuition fees. An undergraduate math major, especially when combined with some economics, is excellent preparation for the study of finance. For more information go to: http://business.rice.edu/PhD_Finance_Area.aspx

Application deadline is January 15, so act fast!

PROBLEMS OF THE WEEK

1. Find all integers, if there are any, greater than 5 for which the expansion in base 5 is the reverse of the expansion in base 8. (For example, the expansion of 207 in base 8 is 317, because 207 = 3 x 64 + 1 x 8 + 7 x 1. Reversing this expansion yields 713, but that isn't the expansion of 207 in base 5 [which would be 1312]. So 207 doesn't work.)

2. A can is in the shape of a (right circular) cylinder of radius $r$ and height $h$. For the purpose of this problem, ignore seams, the thickness of the metal, etc., so that the surface of the can is assumed to consist of two congruent circular disks of radius $r$ and the cylindrical "mantle" where the label would be. An intelligent ant is at a point on the "top" circle (that forms the edge of the top of the can) and wants to crawl to the point on the "bottom" circle that is diametrically opposite to its starting point. As a function of $r$ and $h$, how far must the ant crawl? (You may not be able to prove rigorously that your answer is the best possible, but give as much justification as you can.)

Many thanks to Gail Nelson for providing the excellent problems you enjoyed last term. She reports that Henry Luo solved the first problem from November 13; Henry should stop by CMC 216 to pick up a B.B.O.P. item. The routine for the rest of the year will be similar to what happened in the fall. Specifically, correct solutions that reach me by Tuesday evening will be acknowledged in that week's Gazette and will be eligible for B.B.O.P. rewards. The preferred way to get solutions to me is to put them in my box in the CMC, but you can also send them by campus mail, or in the body of an e-mail. (Please do not send attachments.) Good luck on the new problems, and stay warm!

- Mark Krusemeyer

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