
TCU Math News Letter

Volume 13, Number 3 November 2004

Nature is an infinite sphere of which the center is everywhere and the circumference is nowhere.

- Blaise Pascal

[Editor: Dr. Rhonda Hatcher](#) and [Archive of Newsletters](#)

"Fun with Power Series" at the Next Parabola Meeting

Parabola, the TCU undergraduate mathematics student organization, will hold its next meeting on Tuesday, November 9. The meeting will begin with a pizza lunch at 11:30 a.m. in TTC 300. Following lunch, Professor Matt Papanikolas of Texas A&M University will present the talk "Fun with Power Series" in TTC 243.

All TCU students, faculty, and other members of the community are invited to attend the meeting.

TCU Frank Stones' Research Lectureship Series

Professor Matt Papanikolas of Texas A&M University will present a talk in the TCU Frank Stones' Lectureship Series on Tuesday, November 9. He will present the talk "Hypergeometric Functions over Finite Fields and Modular Forms" in TTC 246 at 4:00 p.m.

Refreshments will be served in TTC 300 at 3:30 p.m.

American Mathematical Society Web Site for Undergraduates

The American Mathematical Society maintains a web site aimed at undergraduate mathematics majors or students who are considering majoring in math. The web site has links to other web sites containing information about graduate schools in mathematics, summer programs for mathematics majors, semester programs Budapest and Moscow, careers in mathematics, job internships, conferences, competitions, and more. The web site address is www.ams.org/employment/ugbrochure.html.

University Career Services Newsletter for College of Science and Engineering

University Career Services offices issued its first newsletter aimed specifically at students in the College of Science and Engineering. The newsletter, "Career Corner for the College of Science and Engineering," outlines the many services offered by University Career Services. Among these services are job listings, preparing graduate school applications, help with job and internship searches. You can find this newsletter

at the web site <http://www.careers.tcu.edu/collegenewsletters.htm>.

Solution to the September 2004 Problem of the Month

Problem: The board of directors of the Problems For Fun Corporation meets every n months. At the most recent meeting, the CEO observed that, since the last meeting, the company made a profit in each period of 8 consecutive months. The CFO then said: "Yes, but in each period of 5 consecutive months over that time we lost money." Show that the largest possible value of n is 11. (Due to Henry Winkler.)

Solution: We first show that a 12-month interval is impossible. For any 3-month period, there is a 5-month period, where the company loses money, either just before or just after it. Together they comprise an 8-month period where the company makes money. We conclude that the company must make a profit over any 3-month period. Similarly, we now conclude the company loses money over any 2-month period. Twelve months may be broken up into four 3-month periods, with the company making a profit in each, or six 2-month periods, with the company losing money in each. This is impossible. For 11 months, the reasoning above does not allow us to conclude the company makes a collective profit over months 5, 6, and 7 or has a collective loss over months 3, 4 or 8, 9. We won't be able to partition 11 months into money-losing periods. With some effort, one finds an example of monthly net incomes such as 6, -10, 6, 10, -14, 7, -14, 10, 6, -10, 6.

November 2004 Problem of the Month

Time for an easier one. What is the largest number of congruent regions of area 1 that can be packed inside a circle of radius 2004 without overlapping?

Students and others are invited to submit solutions to Dr. George Gilbert (Math Dept. Office or P.O. 298900). Correct solutions submitted by persons who are not members of the TCU math faculty will be acknowledged in the next issue of the newsletter. Note that a correct solution is an answer and a justification of its correctness. The solution to the problem will be published in the next edition of the newsletter.

The TCU Math Newsletter will be published each month during the academic year. Dr. Hatcher: Editor; Dr. Gilbert: Problem Editor; Dr. Doran: Thought of the Month Editor. Items which you would like to have included should be sent to Dr. Hatcher (Math Dept. Office or P.O. 298900).