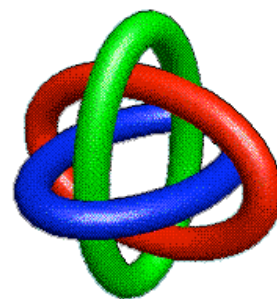


TCU MATH NEWSLETTER



[Problems & Solutions](#) | [Newsletter Archive](#) | [Mathematics Home Page](#)

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Prediction is very difficult, especially about the future.

- Niels Bohr

TCU Calculus Bee on April 21

The annual TCU Mathematics Department Calculus Bee will be held on Tuesday, April 21 at 4:00 p.m. in Tucker Technology Center 138. Refreshments for the contestants will be served at 3:30 p.m. in TTC 300.

All TCU undergraduates are eligible to compete. Prizes will be awarded to the top three finishers, with \$75 for first place, \$50 for second place, and \$25 for third place.

Students wishing to compete in the Calculus Bee should sign up in the Mathematics Department office in TTC 206. While there is no deadline for signing up, we would like to know who is participating as soon as possible.

Duy Nguyen Awarded an SERC Grant

Undergraduate mathematics major Duy Nguyen was awarded a TCU College of Science & Engineering Research Center grant. Duy will use the grant to fund his participation in the National Science Foundation Research Experience for Undergraduates (REU) program at Central Michigan University this summer.

The SERC Undergraduate Summer Research Grant program provides travel and accommodation support for TCU undergraduate students in need of performing summer research at a research facility or location outside of the Metroplex. For more information about SERC and its grant programs visit the website www.serc.tcu.edu.

Duy Nguyen's Piano Recital on April 24

Duy Nguyen is not only a mathematics major at TCU; he is also a piano performance major studying with Harold Martina. Duy will have a piano recital at 5:00 p.m. on Friday, April 24 in

Three Mathematics Majors Honored with Phi Beta Kappa Invitations

Three TCU mathematics majors were invited to join the prestigious national honor society Phi Beta Kappa. Liron Bainglass, Thanh Huynh, and Darren Ong were honored and will be initiated into membership on May 8. Senior mathematics major Thomas Sheffield was initiated last year as a junior.

Darren Ong Named Mathematics Senior Scholar

Darren Ong was selected as the 2009 Mathematics Department Senior Scholar. The winner of this award is selected by the Mathematics Department Faculty. The award will be presented to Darren at the TCU Honors Banquet on April 16.

TCU Student Research Symposium on April 17

The fifth annual TCU Student Research Symposium will be held in the Tucker Technology Center on Friday, April 17. In the symposium, students from the TCU College of Science and Engineering present their research in poster displays throughout the building. The symposium will also include a keynote speaker, Dr. Robert Middaugh, an anesthesiologist and former student of Dean McCracken. Dr. Middaugh will present his talk at 4:30 p.m. in Sid W. Richardson Lecture Hall 1.

NSF/CBMS Regional Conference to be Held at TCU

An NSF/CBMS Regional Conference in the Mathematical Sciences, Topology, C^* -algebras, and String Duality, will be hosted by the TCU Mathematics Department on May 17-22, 2009. Professor Jonathan Rosenberg of the University of Maryland will be the principal speaker for the conference, and the conference will also feature sixteen other speakers. The conference is being organized by Professor Robert Doran and Professor Greg Friedman. Sixty-six mathematicians from universities across the country will be

PepsiCo Recital Hall. He would love for his professors and fellow students to attend. The recital is free and open to the public.

attending the conference. For more information about the conference visit the conference website faculty.tcu.edu/gfriedman/CBMS/.

Problems and Solutions

Solution to the March 2009 Problem of the Month

Problem: Is there any circle centered at the origin that is tangent to the curve $y = \sin x$?

Solution: There is no such circle. Suppose the circle $x^2 + y^2 = r^2$ is tangent to the curve. Then the slopes coincide, which means $y \neq 0$. By implicit differentiation, the slope on the circle is $dy/dx = -x/y$. The slope for $y = \sin x$ is $dy/dx = \cos x$. Equating derivatives, we see

$$x = -y \cos x = -\sin x \cos x = -\sin 2x / 2.$$

However, the derivative of $x + \sin 2x / 2$ is $1 + \cos 2x \geq 0$. Thus, $x + \sin 2x / 2$ is increasing, hence is 0 only for $x = 0$, implying the point of intersection is the origin, a contradiction.

April 2009 Problem of the Month

Find the right circular cone of minimum volume that is circumscribed about the unit cube, with one face of the cube in the base of the cone.

Students and others are invited to submit solutions to Dr. George Gilbert by e-mail (g.gilbert@tcu.edu) or hard copy (Math Dept. Office or TCU Box 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 is
published each
month during the
academic year.*

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**Thought of the
Month
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Robert Doran