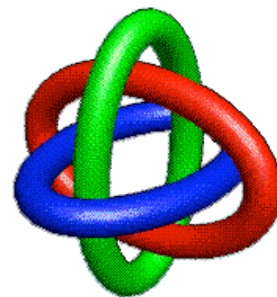


# TCU MATH NEWSLETTER



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March 2010  
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*The series is divergent; therefore we may be able to do something with it.*

*- Oliver Heaviside*

## TCU Department of Mathematics Now Accepting Applications for the Ph.D. Program

Applications are now being accepted for the Ph.D. program in the TCU Department of Mathematics. The application deadline is April 15, 2010. Competitive stipends are available to qualified applicants.

For details about the admission requirements and the Ph.D. program see [www.math.tcu.edu/PHD/](http://www.math.tcu.edu/PHD/) and [TCU Ph.D. Information Flyer](#).

## "Hard Problems"

The film "Hard Problems: The Road to the World's Toughest Math Contest," a documentary about the U.S. team in the 2006 International Mathematical Olympiad will be shown on Thursday, March 25, at 3:45 in Tucker Technology 244. Running time is 82 minutes. Refreshments will be served at 3:30 in TTC 300.

## Frank Stones Mathematics Research Lectureship

Professor Peter May of the University of Chicago will present the talk *Finite Topological Spaces* on Tuesday, March 9 at 3:00 p.m. in Tucker Technology Center 244.

All TCU students and faculty and other interested members of the community are invited to come to the talk. Refreshments will be served before the talk in TTC 300.

## Parabola Talk

Darren Ong, a former TCU mathematics major who is now working on his Ph.D. in mathematics at Rice University, will present the talk *A Theorem of Intersecting Conic Sections* at 3:00 pm on Monday, March 1 in Tucker Technology Center 244.

## Student Research Symposium Call for Abstracts

The Michael and Sally McCracken Annual Student Research Symposium (SRS) will be held on Friday, April 16, 2010. The SRS will showcase student research from the TCU College of Science and Engineering and offer a relaxed forum in which students can present their work in a poster presentation.

Any undergraduate or graduate student who has been engaged in some form of research is strongly encouraged to participate. The deadline for abstract submissions is Friday, March 26.

For more information about SRS and to submit an abstract, visit the SRS website [www.srs.tcu.edu](http://www.srs.tcu.edu).

## TCU Pi Day Celebration on March 26

The TCU Pi Day Celebration will be held in Tucker Technology Center 139 on Friday, March 26 between 11:00 a.m. and 1:00 p.m. (come and go). Pi Day is normally celebrated on March 14 (3/14) because of the connection to the decimal expansion for pi, 3.14... However, because that day is the first weekend of Spring Break, we will celebrate it on March 26.

The party is hosted by the Mathematics, Computer Science, and Engineering Departments. It will feature a pizza-eating contest, a robot fighting contest, and throwing a pie at the face of one of your favorite professors. All TCU students and faculty are invited to join the fun.

**Problems and Solutions**

**Solution to the February 2010 Problem of the Month**

**Problem:** You are declarer in a no-trump contract in bridge. All four deuces win tricks. What is the maximum number of tricks you can win? (Due to Tim Keller.)

**Solution:** You can win at most nine tricks.

For a deuce to take a trick, it must be led and the other three players must be out of the suit. If a deuce takes the first trick, West, the initial lead, must have all thirteen cards of that suit and will take all thirteen tricks. Thus, the player leading a deuce must also have won the previous trick. Now consider the last deuce to take a trick. Each of the other players must have taken the trick with the deuce in whatever suits they have left, so each player must win a trick with a deuce as well as the preceding trick. Thus, declarer (and partner) can win at most nine tricks. The following is an example where declarer wins exactly nine tricks. Each column represents a trick, with the card led underlined.

West	<u>A♠</u>	<u>2♠</u>	<u>3♥</u>	K♠	Q♠	J♠	T♠	9♠	8♠	7♠	6♠	5♠	4♠
North	3♠	A♥	K♥	<u>2♥</u>	<u>3♣</u>	Q♥	J♥	T♥	9♥	8♥	7♥	6♥	5♥
East	4♥	A♣	K♣	Q♣	J♣	<u>2♣</u>	<u>3♦</u>	T♣	9♣	8♣	7♣	6♣	5♣
Declarer (S)	4♣	A♦	K♦	Q♦	J♦	T♦	9♦	<u>8♦</u>	<u>7♦</u>	<u>6♦</u>	<u>5♦</u>	<u>4♦</u>	<u>2♦</u>

**March 2010 Problem of the Month**

A two-dimensional disk of radius 1 rolls down a line in the plane making acute angle  $\theta$  with the positive  $x$ -axis. Consider a point on the disk a distance  $r$  from the center of the disk. For what  $r$  will both the  $x$ - and  $y$ -coordinates of this point always decrease as the disk rolls?

Students and others are invited to submit solutions to Dr. George Gilbert by e-mail ([g.gilbert@tcu.edu](mailto: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  
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