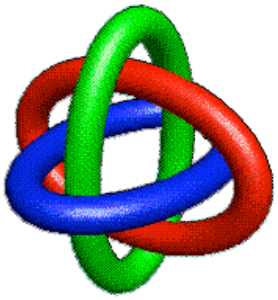
# TCU MATH NEWSLETTER





October 2010
Volume 19, Number 2

*If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.*

*- John von Neumann*

## Parabola Talks on October 6 and October 27

Professor George Gilbert of the TCU Mathematics Department will present the talk ***Paradox Lost: The Evils of Coins and Dice*** at the next meeting of Parabola on Wednesday, October 6. The talk will be held in Tucker Technology Center 138 at 3:30 pm, and refreshments will be served at 3:00 pm in TUC 300.

To give an idea of the what the talk will be about, suppose that 9 coins are put on a table - some heads up, some tails up. Flip a coin that is weighted to come up heads 2/3 of the time. When you flip heads, you may remove one heads coin; when you flip tails, you may remove one tails coin. How many of the 9 coins initially placed on the table should be placed heads up for the fastest removal of all 9 coins? In the talk, Professor Gilbert will consider questions of this type. Several results may at first seem paradoxical, or at least non-intuitive.

The annual Halloween Parabola meeting will be on the afternoon of Wednesday, October 27. Watch the TCU Math Department website for details.

Parabolas talks are accessible to undergraduate students. All faculty, students, and interested members of the community are invited to attend.

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## Putnam Mathematics Contest

The 71st Annual William Lowell Putnam Mathematical Competition will be held on Saturday, December 4, 2010, from 9:00 am to noon and 2:00 to 5:00 pm. The questions require different levels of mathematical background, and all require a bit of ingenuity to solve. The scores on the exam are typically quite low, and even answering a couple of questions is considered an excellent performance. The competition is open to undergraduates enrolled in colleges and universities of the United States and Canada who have not yet received a college degree.

Those interested in signing up to take the Putnam exam this year should contact Professor George Gilbert at g.gilbert@tcu.edu by 5 pm on Tuesday, October 5.

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## TCU Frank Stones Research Lectureship Series Talks on October 15, 22, and 29

Three speakers will be giving talks in the month of October in the TCU Frank Stones Research Lectureship Series. Professor John Osoinach of University of Dallas will give a talk on Friday, October 15. Professor Steven Pankovich of the University of Texas at Arlington will speak on Friday, October 22, and Professor Danijela Damjanovic of Rice University will speak on Friday, October 29. Watch the TCU Math Department website for details about the talks.

The Lectureship talks will be held in Tucker Technology Center 138 at 3:30 pm. Refreshments are served before the talks in TUC 300 at 3:00 pm. The lectures are open to all students, faculty, and other interested members of the community.

## *Problems and Solutions*

*The TCU Math Newsletter is published each month during the academic year.*

**Editor:**
Rhonda Hatcher

**Problem Editor:**
George Gilbert

**Thought of the Month Editor:**
Robert Doran

## Solution to the September 2010 Problem of the Month

**Problem:** In a round robin tournament, each team played every other team exactly once. Suppose each game ended in a win or loss; i.e. there were no ties. Suppose there are teams $T_1, T_2, ..., T_n$ such that team $T_i$ defeated team $T_{i+1}$ for $i = 1, 2, ..., n\text{-}1$, and team $T_n$ defeated team $T_1$. Must there be three teams $S_1, S_2$, and $S_3$, where $S_1$ defeated $S_2$, which defeated $S_3$, which defeated $S_1$?

**Solution:** Our proof will be by induction on $n$. Note that the smallest possible $n$ satisfying the conditions is $n$=3, for which the claim is trivial. Assume the claim holds for $n$-1. If $T_1$ defeated $T_{n-1}$, then $T_1, T_{n-1}$, and $T_n$ form the desired triple. If not, then $T_1, T_2, ..., T_{n-1}$ satisfy the conditions and so such a triple exists by the inductive hypothesis. This month's problem was solved by graduate student Alissa Garrett and Brad Beadle ('96).

## October 2010 Problem of the Month

A recent episode of Futurama centered on a mind-switching machine. The machine could exchange the minds between two bodies but could not exchange the minds between the same pair of bodies ever again. The Professor and Amy switch bodies. What is the smallest number of additional people needed to use the mind-switching machine to put everyone's mind back into their own bodies? This problem was suggested by Greg Friedman. (Who would have guessed?)

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.