

# TCU Math Newsletter

*To see a World in a Grain of Sand,  
And a Heaven in a Wild Flower,  
Hold Infinity in the palm of your hand  
And Eternity in an hour.*

- William Blake

## **Applications for 2015-2016 SERC Undergraduate Research Grants Due March 27**

The TCU Science and Engineering Research Center (SERC) will be awarding research grants for the 2015-2016 academic year to undergraduate students engaged in research with faculty in the TCU College of Science and Engineering. Proposals from all academic departments in the college are welcome and encouraged. The grants will range from \$500 to \$1500 depending on the needs of the proposed research project. Student applicants must have junior or senior standing with anticipated graduation in May 2016 or later, although exceptions can be made for highly qualified sophomores with the recommendation of a faculty mentor.

The application form for the SERC Undergraduate Research grants and additional information is available on the SERC web site [www.serc.tcu.edu](http://www.serc.tcu.edu). Students interested in applying should contact a faculty member in the college to see if he or she would serve as a faculty mentor, and be sure to apply by the March 27, 2015 deadline.

## **TCU Graduate to Present Actuarial Talk on March 20**

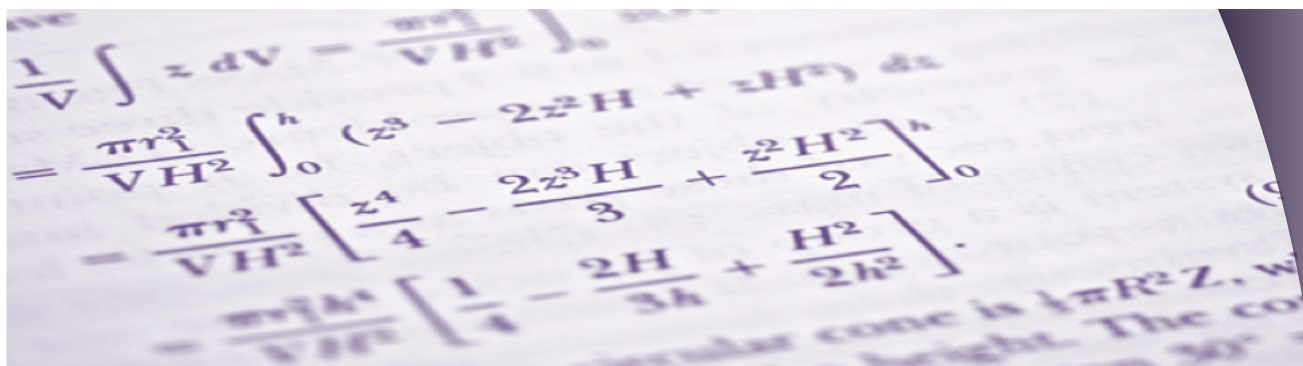
Traci Hughes, an Actuarial Associate of Lewis and Ellis, Inc. and recent TCU mathematics major graduate will be presenting the next talk in the TCU actuarial talk series. Ms. Hughes will discuss what it takes to become a health actuary and what a health actuary does in a typical workday. She will also talk about how to navigate the entry level Society of Actuaries (SOA) exam system.

This talk will be on Friday, March 20 at 12:00 to 12:50 pm in Rees-Jones Hall 113. A free lunch will be provided to those attending. All TCU students interested in considering a career as an actuary are encouraged to attend.

## **2015 TCU Student Research Symposium (SRS) Abstracts Due on March 19**

Students wishing to do a poster presentation at The TCU College of Science and Engineering Research Symposium (SRS) must submit an electronic abstract by Thursday, March 19. The abstract submission page is

[www.srs.tcu.edu/submission/abstract.php](http://www.srs.tcu.edu/submission/abstract.php).



## Solution to the February 2015 Problem of the Month

**Problem:** Players A and B play a game, alternating turns. Player A places a counter on two consecutive integers that do not have a counter on them; then Player B removes one counter that has been played (on any turn). Player A wins if there are ever  $n$  consecutive integers with a counter; otherwise, Player B wins. What is the smallest  $n$  for which A cannot win if B plays optimally?

**Solution:** The smallest  $n$  is 4. Suppose  $n = 3$ . After Player B's first turn, Player A can win by putting two counters adjacent to the one remaining counter. On the other hand, for  $n$  at least 4, Player B can win by removing the counter Player A has just placed on an odd integer. There will never be more than one counter on an odd integer and Player A can never obtain four counters in a row.

## March 2015 Problem of the Month

Show that any closed disk (i.e. a circle and its interior) of radius 1 in the plane contains at least two points with integral coordinates.

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.