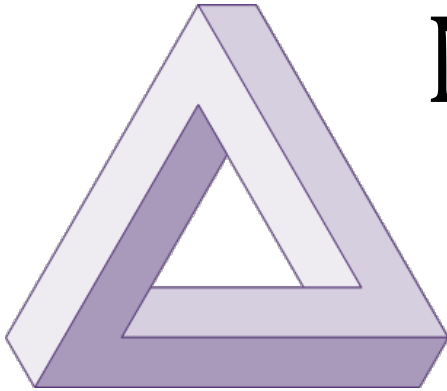# TCU Math Newsletter

It is like asking why Beethoven's Ninth Symphony is beautiful. If you don't see why, someone can't tell you. I know numbers are beautiful. If they aren't beautiful, nothing is.

- Paul Erdős

Two Actuarial Talks in November

The TCU Mathematics Department will host two talks in the actuarial talk series in November. TCU graduate Ariane Pardue of USAA will talk about job opportunities at USAA on Thursday, November 6 at 3:30. On Thursday, November 13, Brian Levine and Alex Bush of AON will talk about job opportunities at AON. Both talks will be in TUC 245. Refreshments will be available before each talk in TUC 300. All interested TCU students are invited to attend.

TCU College of Science & Engineering Fireside Forum on November 13

An alumni career panel will be featured in the next TCU College of Science & Engineering Fireside Forum. The Forum will be in the BLUU Auditorium on Thursday, November 13 from 3:30 to 4:30 pm. All TCU CSE students are encouraged to attend.

## TCU Mathematics Professors at the Jimmy & Rosalyn Carter Work Project

Professors Friedman, Nollet, Park, and Richardson of the TCU Mathematics Department worked at the Habitat for Humanity Jimmy & Rosalyn Carter Work Project in October.

Scott Nollet, Greg Friedman, Efton Park, and Ken Richardson

Talk on Teaching Real Analysis

Professor Barbara Shipman of the University of Texas at Arlington will present the talk "Teaching Real Analysis" on Monday, November 10 at 3:30 pm in TUC 245. Refreshments will be served at 3:00 pm in TUC 300 before the talk.
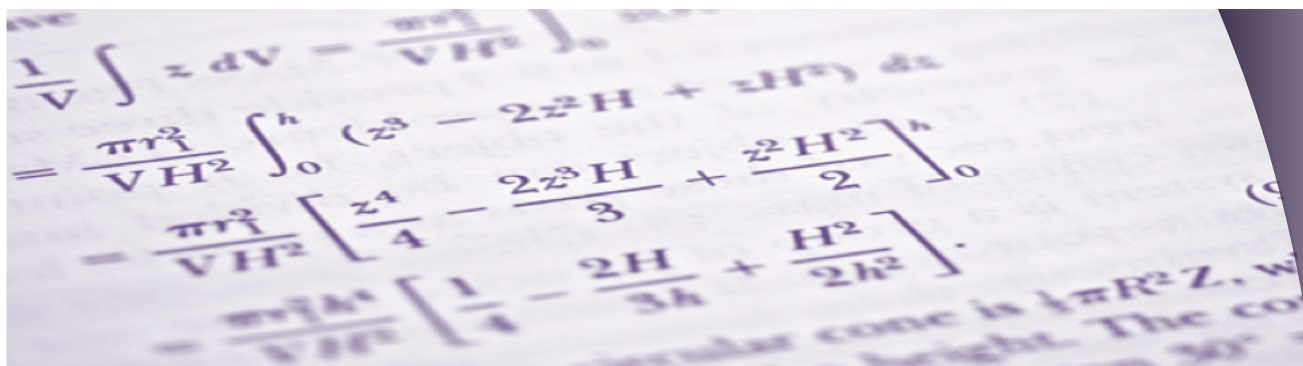
Solution to the October 2014 Problem of the Month

Problem: Show that the integer $3711\ldots11$ is always composite for a positive number of 1s.

Solution: First observe that $111 = 3 \cdot 37$. Thus, if the number of 1s is a multiple of 3, the integer is divisible by 37. Because 3711 is divisible by 3, if the number of 1s is 2 more than a multiple of 3, the integer is divisible by 3. Next observe that $111111 = 3 \cdot 7 \cdot 11 \cdot 13 \cdot 37$. Because 371 is divisible by 7, if the number of 1s is 1 more than a multiple of 6, the integer is divisible by 7. Finally, 371111 is a multiple of 13 so, if the number of 1s is 4 more than a multiple of 6, the integer is divisible by 13.

The October Problem of the Month was solved by Brad Beadle ('96) and Ray Chandler ('64).

November 2014 Problem of the Month

The source for this month's problem credits it to the famous French mathematician Henri Poincaré (1854-1912). Each column of a matrix has exactly one 1 and exactly one -1, the rest of its entries being 0. Show that the determinant of every $r \times r$ submatrix is -1, 0, or 1.

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.