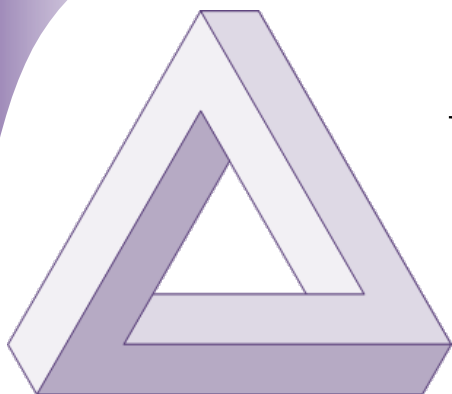# TCU Math Newsletter

Not everything that can be counted counts, and not everything that counts can be counted.

Albert Einstein

TCU Welcomes New Faculty Member Derek Tomlin

Dr. Derek Tomlin joined the TCU Mathematics Department as an Instructor this semester. He is a 2011 graduate of Texas A&M, and he earned his Ph.D. in Mathematics from the University of Texas at Arlington in 2018.
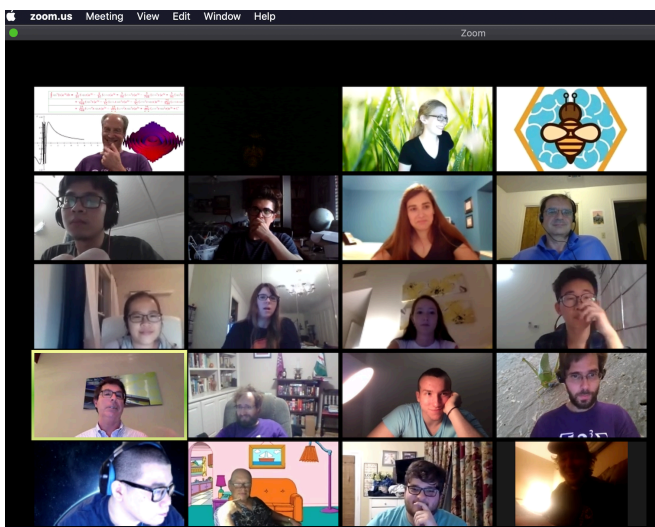
TCU Online Math Clinic

The TCU Math Clinic will operate online during the Fall 2020 via Zoom. The Tutor Schedule and the Zoom link, which is open to TCU students, can be found at https://cse.tcu.edu/mathematics/index.php

SERC Undergraduate and Graduate Research Grant Applications Due September 18

The TCU Science and Engineering Research Center (SERC) is now accepting applications for the Fall 2020 round of SERC Undergraduate and Graduate Research Grants. The grants are used for funding research projects. The application form and more information about the grants are available at www.serc.tcu.edu. The application submission deadline is Friday, September 18, 2020 at 4:00 pm.

2020 Calculus Bee on Zoom

The 2020 Calculus Bee was held via Zoom on April 22, 2020. TCU students participated in the Bee from various places. The first-place winner, Hoang Long Nguyen winner participated from his home country of Vietnam. Second place in the Bee went to Brent Hewitt, and Harry Daniels took third place. Congratulations to all of the winners!
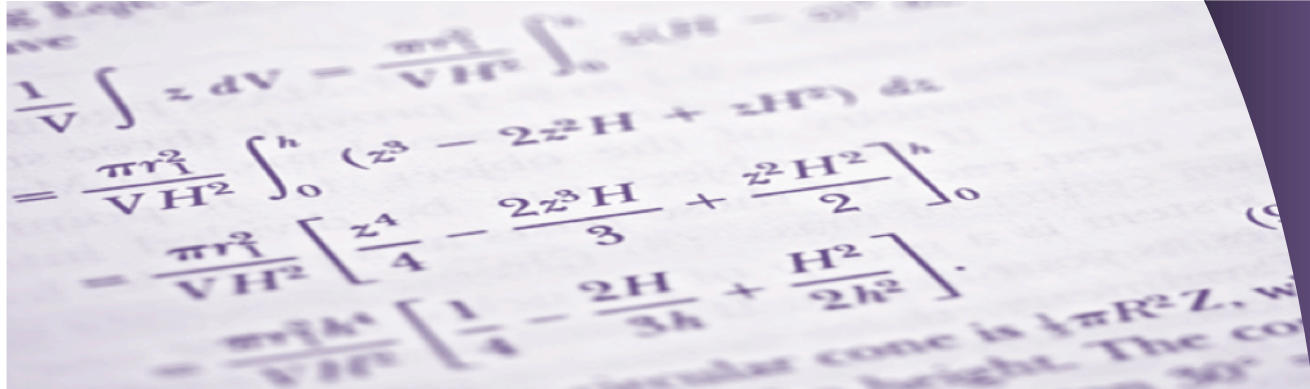

ZOOM Meeting Covering Hiring Event Procedures and Resumés for Math Majors

This year all of the hiring events will take place virtually, including the actuarial hiring fair, the CSE Technology Fair, and the TCU Internship hiring events. Events will be held to help students prepare for the fairs, understand the rules and procedures, and write resumés. Students planning to attend the actuarial hiring fair must attend a preparatory ZOOM meeting hosted by Gabriela Pineider at 5:00 pm on September 2 at the link https://tcu.zoom.us/j/92348549852.

TCU Actuarial Networking Fair

The TCU Actuarial Networking Fair will take place online on September 23 at 12:00-2:00 pm. The fair provides an opportunity for students and companies to interact. More information about the companies attending the fairs and the Zoom Links will be available later.

Solution to the April 2020 Problem of the Month

Problem: A sequence of real numbers begins $x_1, \ldots, x_k$. For $n > k$, the sequence is defined by $x_n = \frac{\sum_{j=1}^{n-1} x_j}{n+c}$ for some constant c. Show that the sequence is eventually constant.

Solution: Set $a = \sum_{j=1}^{k} x_j$. We show that $x_n = \frac{a}{k+c+1}$ for all $n > k$. This is just the definition for $n = k + 1$. We assume the result through index n. Then

$$x_{n+1} = \frac{a + (n-k)\dfrac{a}{k+c+1}}{n+1+c} = \frac{a \dfrac{(k+c+1) + (n-k)}{k+c+1}}{n+1+c} = \frac{a}{k+1+c}.$$

The Problem of Month was solved by Hoang Long Nguyen.

September 2020 Problem of the Month

Find all constants c such that the curves $y = 1 - x^2$ and $y = c/x$ are tangent (i.e. have a common tangent line at a point of intersection).