

# TCU Math Newsletter

*It is very humbling to receive the Fields Medal. The words of a Fields Medalist carry a lot of weight within mathematics. . . . which means I have to watch what I say more carefully now!*

*Terry Tao*

## TCU Classes Online

Due to the COVID-19 epidemic, TCU moved from in-person classes to online instruction starting on March 23 and continuing through the remainder of the spring semester. TCU Mathematics faculty are providing instruction through videos, Zoom class meetings, and other online resources.

## Advising for Fall 2020 Semester

TCU students will receive academic advising for enrolling in the Fall 2020 semester by working with their advisors by email or through other online formats. All student should plan to register on schedule as usual.

For help in deciding which classes you might like to take, please refer to the planned mathematics course offerings for Fall 2020 through Spring 2023. They are posted on the Mathematics Department web site at <https://mathematics.tcu.edu/wp-content/uploads/2020/03/Schedule4yr-S20-web.pdf>

## Math Majors Honored

Kieutrinh Ha has been named the 2020 TCU Mathematics Department Senior Scholar. The winner of the award is determined by a vote of the Mathematics Department faculty.

Math majors Samuel Becker, Brady Bokelman, Gia Hy Dang, Trystan Deck, Claire Despain, Katie Erickson, Madison Graff, Brooke Harvey, Anne Hatton, Alaina Jerguson, Theofilos Karavasilis, Peter McGinnis, Jessica Patricoski, Rebecca Port, Jennifer Rios, Shashank Saravat, Amelia Schatz, and Thomas Cade Strehfens will be initiated into the mathematics honor society Pi Mu Epsilon this semester.

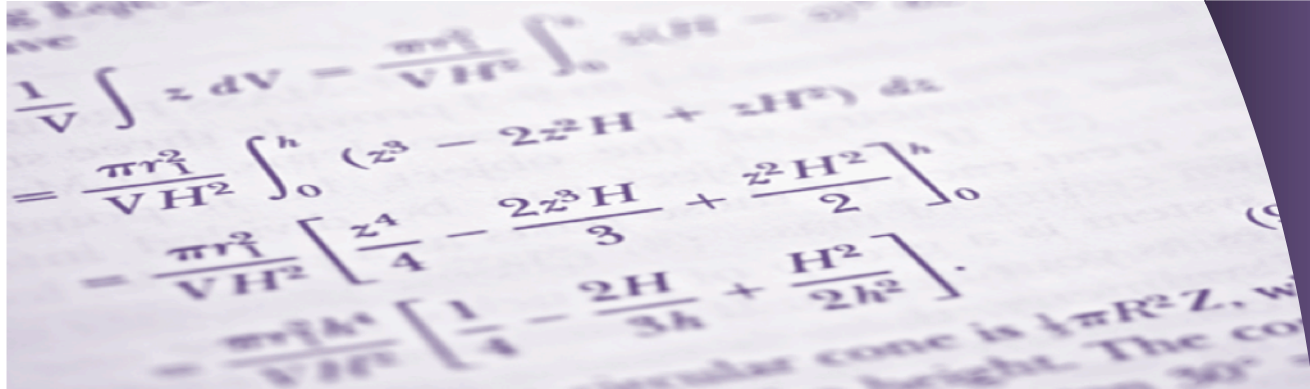
Congratulations to all of the students!

## TCU Math Clinic Remains Open

The TCU Math Clinic will operate online for the remainder of the semester. The hours for the Clinic are 9:00 am to 3:30 CDT Monday through Friday. To access the TCU Math Clinic, go to the TCU Math Clinic website at

[https://tcu.account.box.com/login?redirect\\_url=https%3A%2F%2Ftcu.app.box.com%2Fs%2Fz37mpbxpekki3o7uqino8jkm8zxgl6y1](https://tcu.account.box.com/login?redirect_url=https%3A%2F%2Ftcu.app.box.com%2Fs%2Fz37mpbxpekki3o7uqino8jkm8zxgl6y1)

and enter your TCU username and password. This will put you in contact with one of our tutors via Zoom. If you don't have Zoom and you are a TCU student, you can download it at <https://tcu.zoom.us/>.



## Solution to the March 2020 Problem of the Month

**Problem:** Define a sequence  $(a_n)$  to be rapidly decreasing if  $\sum_{n=1}^{\infty} n^k a_n$  converges for every positive integer  $k$ . Is it true that every rearrangement of a rapidly decreasing sequence is rapidly decreasing?

**Solution:** Not necessarily. Let  $a_n = 2^{-n}$ . Then  $(a_n)$  is rapidly decreasing. Set  $b_{2^k} = a_k = 2^{-k}$  and the remaining  $b_n$  equal to the remaining  $a_n$ , in order. Then  $\sum_{n=1}^{\infty} n b_n$  has infinitely many terms equal to 1 and so diverges.

The Problem of Month was also solved by Brad Beadle ('96).

## April 2020 Problem of the Month

A sequence of real numbers begins  $x_1, \dots, x_k$ . 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.

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.