

TCU Math Newsletter

I never got a passing mark in math. The funny thing is I seem to latch on to mathematical theories without realizing what is happening.

- M. C. Escher (1898-1972),
world famous artist of impossible illusions

Green Chair Visit by Dr. Kevin Knudson on March 28-29, 2023

Dr. Kevin Knudson of the University of Florida will come on a Green Chair visit to the TCU Mathematics Department on March 28 and 29. During his visit he will give several talks. All of these talks are open to the public.

Dr. Knudson's first talk, "Morse Theory: Smooth and Discrete," will be at the graduate mathematics student level. It will be on Tuesday, March 28 at 2:00 pm in TUC 352.

His second presentation, "Origami talk: Five Platonic Friends" is intended for undergraduate students. During the talk, Dr. Knudson will show how to make origami models of regular polyhedra and prove to you that these are the only five. This talk will be on Tuesday, March 28 at 4:30 pm in Bass 101.

His third presentation will be a faculty colloquium talk entitled "Algorithms in Discrete Morse Theory." This talk will be on Wednesday, March 29 at 1:00 pm in TUC 243.

Dr. Knudson will conclude his visit with his featured public talk, "Mathematics of Gerrymandering," on the evening of Wednesday, March 29 at 7:00 pm in SWR Lecture Hall 3. This talk will be accessible to a general audience, and no advanced mathematical knowledge is required.

Undergraduate Groups and Dynamics Conference in Austin, Texas

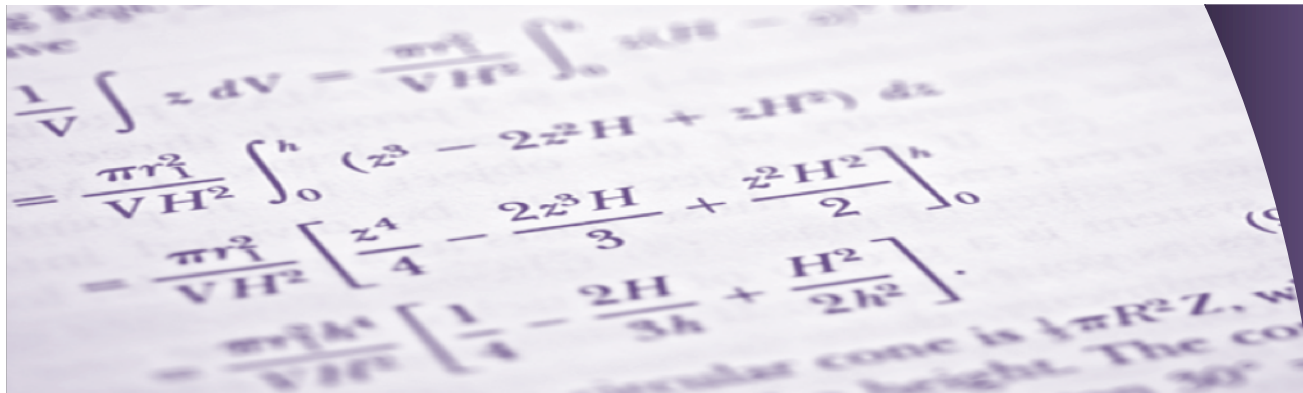
A new undergraduate conference will have its first meeting this spring at the University of Texas, Austin. The conference is called the 2023 Undergraduate Groups and Dynamics Conference, but it is aimed at all undergraduates and beginning graduate students who are involved in research, not just those working in groups and dynamics. The conference will start on the evening of Friday, March 31 and end on the afternoon of Saturday afternoon, April 1. The website for the conference and a link to register can be found at <https://sites.cns.utexas.edu/utgd/uc2023>

Budapest Semesters in Mathematics

Budapest Semesters in Mathematics Education (BSME) is a study abroad program in Budapest, Hungary intended for students interested in the teaching of mathematics at the secondary school level. The 6-week summer session will run from June 20 to August 6, 2023.

At BSME, students learn about the Hungarian approach which emphasizes problem solving, mathematical creativity, and communication. The courses are designed so that credits will be transferable to American colleges and universities. BSME is currently accepting applications for Summer 2023. The due date for applications is April 1, 2023, but applications are reviewed on a rolling basis, so students are encouraged to apply early.

More information, including the online application, can be found at <https://bsmeducation.com/>



Solution to the February 2023 Problem of the Month

Problem: A list of n whole numbers, none larger than 2023 and whose sum is at least $2022n + 1$, is arranged from largest to smallest. Show that the k th number on the list is at least $2024 - k$.

Solution: If not, the most the sum can be is

$$(k-1) \cdot 2023 + (n-k+1)(2023-k) = 2022n - (k-1)(n-k) \leq 2022n,$$

a contradiction.

This month's problems was solved by Brad Beadle ('97).

March 2023 Problem of the Month

Show that $(x+3)^{x+3} x^x > (x+2)^{x+2} (x+1)^{x+1}$ for all positive x .

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.