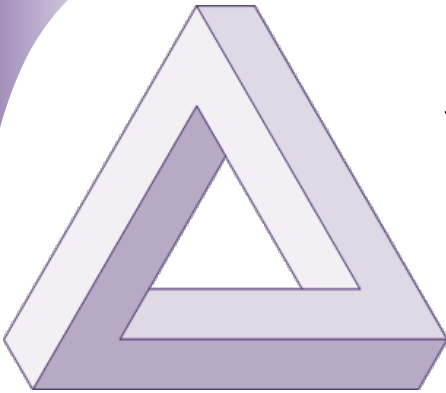# TCU Math Newsletter

"Why should I be worried about dying? It's not going to happen in my lifetime!"

*- Raymond Smullyan
(Mathematician, magician, concert pianist, and logician)*

Three TCU Students Present Talks at Texas Undergraduate Mathematics Conference

The sixteenth annual Texas Undergraduate Mathematics Conference was held online this year on October 30. Three TCU undergraduates presented talks at the conference. Hy Dang presented the talk "Wound Healing Process Modeling Using Partial Differential Equations and Deep Learning," Minh Bui presented "Parameter Shrinkage for Estimating Reading Fluency Count Models," and Khoi Nguyen presented "Some Properties of Riemannian Manifolds of Positive Scalar Curvature."
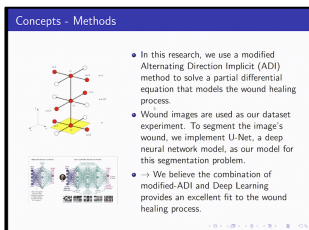
Clockwise from top: Hy Dang, Minh Bui, Khoi Nguyen.
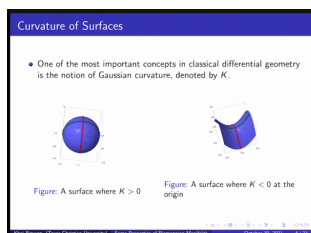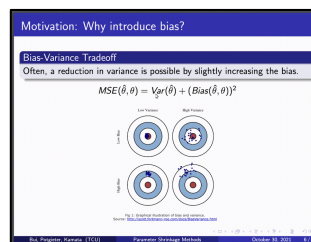
TCU Math Club Meetings on November 16 and 30

The TCU Math Club will meet on Tuesday, November 16 and Tuesday, November 30 at 7:00 pm in TUC 352.
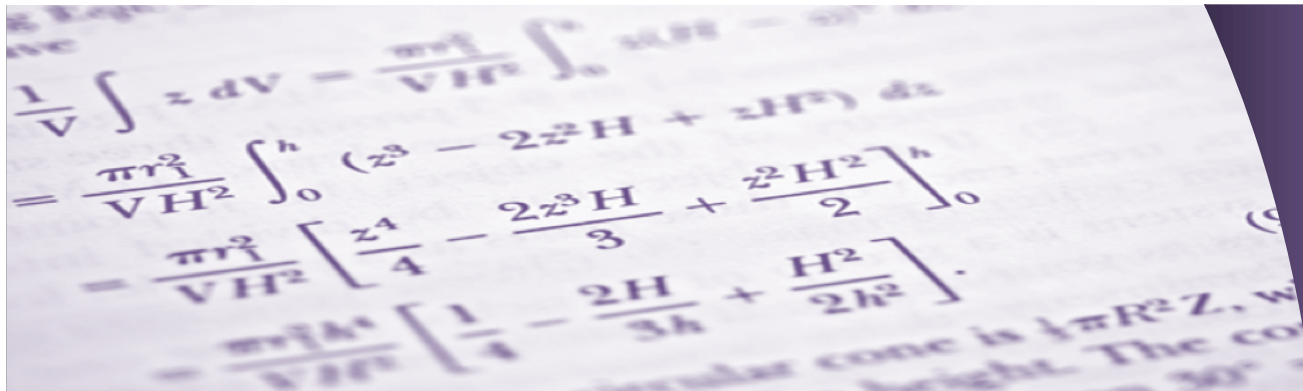
The TCU Math Club is an undergraduate student organization for students interested in mathematics. The Math Club's focus is on math talks, math challenges, and math fun. The 2021 president is McGilley Simons. If you would like to join, contact McGilley at K.M.SIMONS@tcu.edu.

Putnam Mathematics Contest Reminder

If you plan to take the 82nd Annual William Lowell Putnam Mathematical Competition, to be held on Saturday, December 4, 2021, from 9:00 am to noon and 2:00 to 5:00 pm., please be sure to sign up by December 2 at https://www.maa.org/math-competitions/putnam-competition.

Additional details were in last month's newsletter:

https://cse.tcu.edu/mathematics/files/2021/Oct21.pdf .

Solution to the October 2021 Problem of the Month

Problem: The faces of a polyhedron are all convex polygons (all interior angles less than 180°). Is it possible for each face to have a different number of sides?

Solution: It is not possible. Let n be the number of faces. Because the faces are convex, two faces intersect in at most one edge. Thus, each face has between 3 and $n-1$ sides, a total of $n-3$ possibilities. Therefore, some two faces must have the same number of sides.

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

November 2021 Problem of the Month

The behavior of $f(x) = x \sin(1/x)$ near $x = 0$ is a standard example when discussing the Squeeze Theorem or, with $f(0) = 0$ so that $f(x)$ is continuous, differentiability. Is the arclength of the curve y=$f(x)$ between $x = 0$ and $x = 1$ finite or infinite?

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.