



The Eighth Adventures in Mathematics

- Mathematics and Technology

FUN ACTIVITIES • FRIDAY, February 14, 2020 • 8:20 AM – 3:00 PM

[Adventures in Mathematics](#) (AIM), a finalist of the 2015 Tech Titans Award (<http://www.techtitans.org/>)-the Future University, is an annual event organized by the Department of Mathematics at Texas A&M University-Commerce for high school math teachers and their students. Participants will be involved in hands-on activities in math, listen to talks on math careers, watch planetarium shows, tour campus, and experience a lunch in the student cafeteria. The purpose of AIM is to increase students' interests in learning mathematics and offer teachers examples, methods and stories, which can be used in classrooms. High school teachers may receive a certificate of Continuing Professional Development Units upon request. A registration fee of \$6 per participant is required to help cover all activities, including the planetarium show, refreshments and lunch. High schools are responsible for their own transportations to Commerce, TX.

For AIM, we also organize the [Northeast Texas Algebra Competition](#) (NTAC) at the level of algebra II. High school students led by their teachers are eligible to participate. In addition to individual awards, team awards will be given to the top five teams. A team score is determined by the sum of the top four scores of each team. At the end of AIM, competition awards and door prizes will be presented. Fifteen competition winners will receive the following prizes and certifications:

- **First Place:** A TI-84, a scholarship of \$2,000
- **Second Place:** A scholarship of \$1500
- **Third, Fourth, Fifth Place:** A scholarship of \$1000
- **10 Honorable mentions:** A scholarship of \$500

To receive the scholarship, a winner must notify the department head of mathematics, and attend Texas A&M University-Commerce as a fulltime math major within three years after graduation from high school. Winners are also encouraged to apply for [additional university and math scholarships](#).

To help us prepare sufficient refreshments and parking permits, please register by Friday, January 31, 2020. Contact Dr. Tingxiu Wang (tingxiu.wang@tamuc.edu, or 903-886-5958) for questions.

Where: Sam Rayburn Student Center
Texas A&M University Commerce
Commerce, TX 75429

8:20 AM - 8:50 AM: Registration (early registration is appreciated)

8:50 AM - 9:05 AM: Welcome and information (all meet in the Conference Rooms A, B, and C)

9:05 AM - 10:00 AM: Northeast Texas Algebra Competition, Activities I through IX,

10:10AM - 11:00 AM: Keynote: Creating Interesting Ways for Students to be Right AND Wrong by Mr. Eli Luberoff, DESMOS CEO

11:10 AM - 2:00 PM: Lunch, Activities I through IX, teachers only

2:15 PM - 2:45 PM: Competition awards and door prizes (graphing calculators and other gifts) (winners need to be present for door prizes)



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DESCRIPTION OF ACTIVITIES

NORTHEAST TEXAS ALGEBRA COMPETITION (NTAC), 8:50 AM – 10:00 AM

The Northeast Texas Algebra Competition (NTAC) is at the level of algebra II. Each school can have up to 10 students participating in NTAC with two alternates. The alternates may participate if there are extra clickers available. There will be 60 questions and students will have 20 seconds for each question. No pencils, paper or calculators are allowed during the competition. A student will work these questions in his/her head and submit answers with a “clicker.” Any alternate who will take the place of a team member must be reported to the NTAC coordinator by 9:00 AM.

Keynote Speaker: Eli Luberoff, CEO at DESMOS

Creating Interesting Ways for Students to be Right AND Wrong

Correct math depends on right answers. But meaningful math celebrates both right and wrong answers, allowing students to intrepidly explore and express their reasoning in varied and interesting ways. In this session, we’ll examine high- and low-tech ways for teachers to celebrate diverse work and build on student thinking in every form.

Desmos CEO Eli Luberoff’s two dueling loves are learning and programming. He combined those loves in Desmos, a math technology company used by millions of students and teachers around the world. Before Desmos, Eli founded and sold a tutoring software platform, and studied Math and Physics at Yale, where he graduated Summa Cum Laude with distinction in both majors. When not glued to his computer, Eli blows off steam by playing piano or kicking around a soccer ball -- both mostly at random.





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The following activities will be held at the same time for 50 minutes and then repeated if possible.

Activity I: Magical Math and the Algorithms Which Make Them Work by Mrs. Rebecca Steward and Mr. Adam Bowden

Description: In this activity, we will demonstrate several tricks which may seem like magic to accomplish. However, we will reveal the mathematical algorithms hidden behind the curtain. Can you help unravel the mysteries along with us? Come by to participate in the activities, learn the math, and have some fun!

Activity II: From ‘Pure’ Math to Scientific Gadgets by Dr. Mehmet Celik

Description: In this talk we present a road of ‘abstract’ ideas originated by ‘Pure’ Mathematicians and ending up with the creations of scientific gadgets which could not exist today if it had not been for a series of passionate and dedicated women and men. We provide some interesting examples in which we bring up inventors of the scientific gadgets, the “practical” man and what they do. We mention physics – chemistry - biology professors at universities, known also as the “Pure” Scientists, how inventors think that these professors are “wild-eyed”, but the same inventors cannot do their work without consulting with them. Moreover, we talk about professors at the university who know Classical Mathematics and apply it to the scientific findings of the “Pure” Scientists. Oh yes, we also draw attention to a very small number of university professors who draw geometric figures on doughnuts and pretzels (no fooling!) and on rubber sheets. And they also say that $2+2$ is not four. These professors are known as “Pure” Mathematicians. The connoisseurs say that their work is tremendously important for the future.

Activity III: Some Wonders Made by Mathematics by Dr. Nikolay Sirakov

Description: The speaker will explain the use of mathematical concepts in such of modern and fascinating areas like Deep Learning, Machine Learning, and Automatic Tracking Targets in Video; Weapons Detection and Treat Assessment; Objects and Features Extraction; Diagnosis of Melanoma. A number of images and visual experimental results obtained by the speaker and his collaborators will be shown during the presentation.

Activity IV: Math Club Activities by Math Club Organizers

Description: This workshop will present creative, interactive, and engaging math activities. Participants will have the opportunity to witness and experience the creative aspects of math and catch a glimpse into the fascination and delight mathematicians experience when thinking about mathematics.

Activity V: Student forum led by Mrs. Laura Beene

Description: University students will share information about campus life, extracurricular activities, math clubs, Greek life, undergraduate research and career options. Student questions about life at TAMUC will be answered in this session.

Activity VI: Drones by Dr. Burchan Aydin

Description: Drones are emerging into various industries and almost all aspects of our lives. The existing and future applications of drones in civil and commercial domains will be presented. Additionally, a basic drone programming activity will be demonstrated. Seating is limited, and admission tickets are required.

Activity VII: 3D-Printing by Dr. Perry Moler

Description: In a computer lab, students will learn about 3D-scanning and 3D- printing. Then there will be a live demonstration. Seating is limited, and admission tickets are required.

Activity VIII: Campus Tour

Description: Touring the campus of Texas A&M University-Commerce can take hours. However, during this 50-minute tour, students will be guided through the central part of the campus and visit the departments of Biology, Chemistry, Engineering and Technology, and Physics.

Activity IX: Planetarium Show, TBA

Description: a title will be elected in January. Seating is limited, and admission tickets are required.

For Teachers Only by Ms. Laura Beene and Ms. Debra Newton

Description: In this session math teachers will have the opportunity to experience various activities integrating technology that can be used in a mathematics classroom. Activities presented can be used in the following subject areas: Algebra I, Algebra II, Geometry, and Pre-Cal.