

Welcome to the first issue of the Mustang Memo! We have a lot of exciting competitions, classes, and interesting mathematical information in store for you, so **before you click away**, we encourage you to scan through the Memo and see if there is anything either you, family, friends, or students might find interesting! Feel free to forward this email as you deem appropriate, and enjoy!

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Upcoming Tournaments

3MT is an **online middle school** math tournament run by a group of mathematically experienced high school and college students who are dedicated to providing a high-quality and enjoyable contest for middle school students globally. Our tournament is meant to be **mathematically challenging** but also guaranteed to be **enjoyable** and **competitive** for all students in grades 5-8 (younger students are also welcome). The tournament is on **November 19, 2022** from 9:00 AM to 11:30 AM PT and students will be competing **individually**. For more information about our tournament and registration, visit the Mustang Math website!

Mustang Mini Math Tournament (3MT)

We are also pleased to announce the date for MMT 2023! This year's competition will be happening on **April 29, 2023**, and will feature two in person sites, one in or around **Seattle, WA** and the other near **San Francisco, CA**. Additionally, there will be a **synchronous online** tournament as well, for other students not from the area to participate as well, so make sure to mark your calendars - this year's tournament is going to be a good one!

News

Mustang Math is starting new endeavors to help young mathematicians learn!

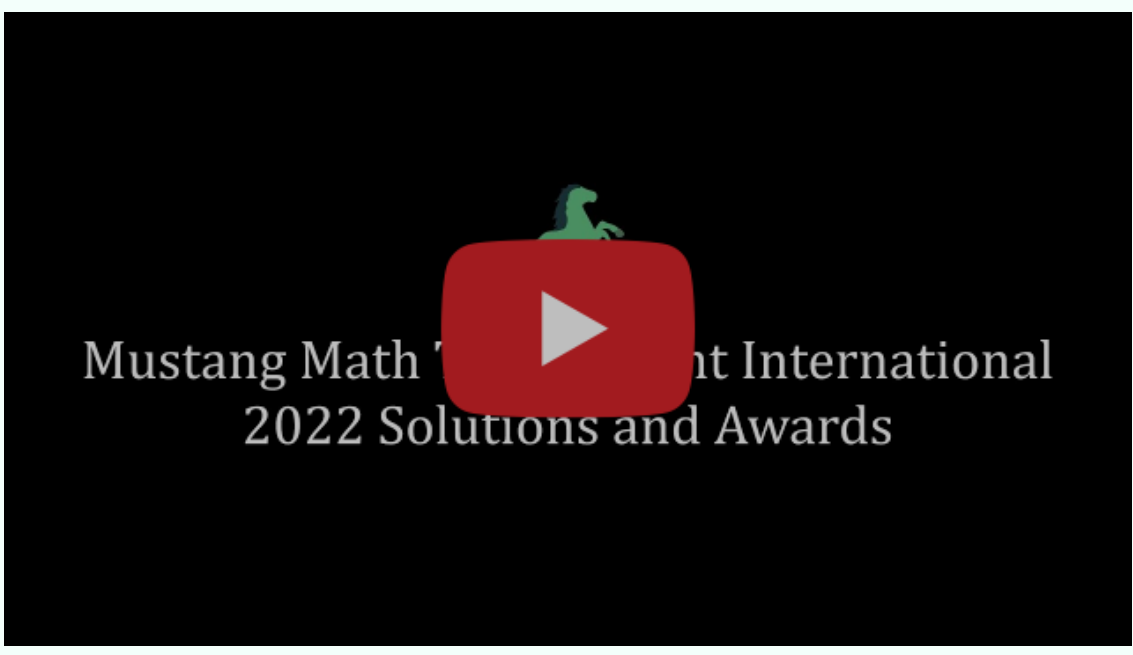
Classes

We're introducing our own competitive math class series! Everyone is welcome to join, but classes will be targeted to beginner and intermediate level students with a goal of preparing the students for various competitions. Our classes will cover subtopics of algebra, combinatorics, number theory, and geometry. Each class will meet for **8 weeks, 90 minutes** per week and they are starting the week of October 17th. The cost is **\$80**, with financial aid available as needed. **Registration closes soon on October 15!** To sign up and learn more, please click on the link below:

Mustang Math Classes

YouTube Channel

Our YouTube channel recently debuted! We have released our first video, detailing solutions from the 2022 Mustang Math tournament. Watch it below!



Upcoming Events

Our Community Engagement is planning to host an event on 10/24 at 1:30 PST/4:30 EST. The event will involve innovative and creative puzzle solving. To participate in the event join Mustang Math's community server. We would love to have you there!

Mustang Math Community server

Dear Marvelous Mustangs,

My name is Arpit Ranasaria, and I am the founder and director of Mustang Math. Mustang Math was started when a few high school students and myself wanted to give back our love for math and create a competition that was different from the rest - we wanted to emphasize collaboration and teamwork, as well as a competition that was both fun and competitive. And thus, Mustang Math was born. Since then, we've grown tremendously, with our participation increasing exponentially each year.

As a result, it has been an eventful past few months at MM! From running our first international tournament, recruiting new members from across the globe, and beginning a lot of new projects, we've been working hard on a plethora of initiatives, and this newsletter is to tell you all about them!

For those of you who are unfamiliar, Mustang Math is a **501(c)(3) nonprofit organization** of committed high school and college volunteers who are dedicated to piquing curiosity in mathematics and promoting a spirit of collaboration among middle school students around the world. This newsletter is one method of achieving this, as we let you know about all the cool ventures happening within our organization, tell you some interesting mathematical tidbits, and also shine light on many other awesome volunteer-run mathematical organizations and opportunities like our own!

I hope you enjoy the first edition of the MM Newsletter, and I hope to see you next time!

Best Wishes,
Arpit Ranasaria

Overview of the QM-AM-GM-HM Inequality

In your math class, you might have learned about inequalities and how to solve them. They seem pretty straightforward, but there are a lot of interesting and famous inequalities. One example is called the mean inequality chain, or the QM-AM-GM-HM inequality.

To read more about the QM-AM-GM-HM Inequality, click the link below!

Click here to read!

Introduction to Tropical Arithmetic

Ask any third grader what 3 times 3 is or 2 plus 2 is and they'll respond with 9 and 4, maybe almost immediately. But who says multiplication and addition have to work like this? Some of you may have seen those competition math questions like "Define $a \cdot b = 3a+5b$, compute $5 \cdot 2$ ". Well, in tropical arithmetic, we do just that!

To read more about tropical arithmetic, click the link below!

Click here to read!

Mathematician of the Month: Adrien-Marie Legendre

Adrien-Marie Legendre was born on September 18, 1752 in Paris, France. He was born into a wealthy family and was educated very thoroughly in both mathematics and physics, eventually contributing large amounts to both fields. His most famous works include being on elliptic integrals, a simple proof that π is irrational, as well as the first proof that π -squared is irrational even conjecturing that π is a transcendental number.

His career started when he taught mathematics at the École Militaire at just the age of 23. Legendre's first recognition came when he won an award for projectiles finding the curve of their trajectory with account to air resistance. His essay on the topic jump started his research career. One of his first topics he studied was the attraction of ellipsoids. It was in his research here that he introduced to the world what we now call the Legendre functions. This research cemented him as a legitimate scholar placing him in the Académie des Sciences.

Some of the other notable contributions of Legendre include being on the team that standardized the metric system. While he worked with both weights and distance, it was his work on the meter that he is most remembered for. His committee took astronomical observations and triangulations which calculated the length which we call the meter today.

While these are just some of Legendre's works, there are so many more that he is known for. For example, in the fields of calculus and physics, Legendre transformations and Legendre polynomials are both named after him for his work on them. In statistics, he developed the least squares method which still has application in the field to this day.

While not as famous as his contemporary and rival Gauss, Legendre is regarded as a great mathematician who used his skills to propel the field of math forward. As a respect to his honor, his name is among the 72 on the Eiffel Tower. To read more about Legendre, see the links below.

<https://mathshistory.st-andrews.ac.uk/Biographies/Legendre/>

<http://fermatlasttheorem.blogspot.com/2005/10/adrien-marie-legendre.html>

<https://mathworld.wolfram.com/LegendrePolynomial.html>

Other Awesome Student-Run Initiatives

BIMCT Fall 2022 Tournament

What: Tournament

Who: Middle and High School Students

When: October 9, 2022 from 10:00 AM - 5:00 PM PT

Where: Online (Zoom)

Cost: Free

[Learn More](#)

InteGIRLS Fall 2022 Competition

What: Competition

Who: Female and Nonbinary Middle School Students

When: October 16, 2022 from 7:00 AM - 11:30 AM PT

Where: Online (Zoom)

Cost: Free

[Learn More](#)

Nanomath 2022 Fall Math Meet

What: Contest

Who: High School and Middle School Students

When: October 22, 2022 at 9:15 AM - 4:00 PM PT

Where: Online (Zoom)

Cost: Free

[Learn More](#)

OMMC MOMMY

What: AMC 10/12 Mock Test

Who: High School and Middle School Students

When: Opens Mid-October

Where: Online (Asynchronous)

Cost: Free

[Learn More](#)

BMT 2022

What: Tournament

Who: High School and Middle School Students

When: November 5

Where: U.C. Berkeley Campus

Cost: Free

[Learn More](#)

Many Math Circles & More (MMC&M)

What: Math Circle/Classes

Who: Middle School Students

When: Throughout the year

Where: Online (Zoom)

Cost: Free

[Learn More](#)



If you have any concerns, comments, or suggestions, please feel free to email us at: mustangmathtournament@gmail.com

Thank you for your support!

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