



MUSTANG MEMO

January 2023

MUSTANG MATH UPDATES

MMT 2023

The long-awaited Mustang Math Tournament 2023 is now open for sign-ups! MMT 2023 will take place this year on Saturday, April 29th. This tournament is primarily centered around teamwork and collaboration, incentivizing students to work with their teams to not only navigate the challenging and interesting problems of the tournament, but also develop strategies to master the unique and exciting game-like rounds. We will be holding in-person tournaments in both California and Washington, and an online version will be offered as well. Sign up before March 14th to receive the Early Horse cost of \$10, or pay the regular fee of \$15 if you register before April 22nd. For more information and sign-ups, please click the button below!

MMT 2023 Information!

International 3MT

The international 3MT rerun is coming up soon on February 4th! With over 400 international participants, it will be a fun and exciting event!

Puzzle of the Month

The Mustang Memo will be holding a year round puzzle challenge. David Altizio will be creating 12 unique and fascinating puzzles for everyone to solve. The top 3 participants who have solved the most puzzles the quickest by the end of the year will be awarded with cash prizes. Read below to find the puzzle!

ARPITORIAL

Dear Mustang Math Community,

As preparation for MMT 2023 continues here at Mustang Math, the excitement continues to grow! All of our teams have been diligently working on their respective tasks, all of which play a part in the success of the upcoming competition and Mustang Math as a whole. With two different in person competitions and an online tournament, huge progress is being made along with changes that will make MMT 2023 better for all involved—staff and competitors alike.

That being said, we want as many people as possible to be able to exercise their critical thinking skills by solving puzzles and intriguing math problems collaboratively! Competition math encourages you to apply your mathematical knowledge and thinking in new and profound ways in order to solve intriguing and complex problems, and part of our goal here at Mustang Math is to help all students see this beauty in problem solving.

In short, all of us at Mustang Math are delighted to have the chance to work on and execute another wonderful year of MMT! As usual, let us know if you have any questions, and sign up below!

Thanks,
Arpit Ranasaria
Director

Register for MMT 2023

Vieta's Theorems

If you have taken an algebra class, you are probably familiar with polynomials, expressions with many terms. Polynomial terms have integer exponents, and the terms can be added, subtracted, or multiplied, but not divided. The coefficients, numbers in front of a term containing variables, follow some very interesting properties which are collectively called Vieta's Theorems.

READ MORE

The Interesting Nature of Fractals



Try drawing an equilateral triangle. Then, draw a triangle connecting each midpoint. That splits the whole triangle into four smaller ones. For each of the outer triangles, draw another triangle connecting the midpoints of the outer triangle. Continue this process for as long as you can. Whether you know it or not, you've just drawn a fractal!

READ MORE

Carroll's Adventures in Mathland



Charles Lutwidge Dodgson, famously known by his pen name—Lewis Carroll—is best recognized for his literary works: *Alice's Adventures in Wonderland* and its sequel, *Through the Looking Glass*. However, his earliest passions lay in the field of mathematics.

Born on January 27, 1832, in Chestre, England, Carroll was a gifted child who was, by the influence of his schoolmaster father and avid mother, led to have a vivid imagination, a talent for wordplay, and a strong aptitude for studies particularly mathematics and classical studies from a young age. His exceptional mathematics earned him a studentship at his college and later, he became a lecturer at Christ Church and the University of Oxford.

Carroll predominantly worked in the field of mathematical logic, which includes algebra, matrix, geometry, and linear algebra. One of his notable achievements was the invention of a Carroll Diagram, a table used to sort objects and numbers by categories. It can be seen in the common x and y table that is drawn in math classes, and it provides a very sturdy base for mathematical logic. As seen in the Carroll Diagram, Carroll often incorporated the concepts of logic when proving mathematical concepts, using techniques such as a meta theorem and the nature of logical inference. A meta theorem is a theorem that can provide insight into other theorems. It describes the relationship between theorems in a systematic way. Similar to this, the nature of logical inference is deriving new conclusions from existing information.

Though his work in mathematical logic did not receive much attention during his lifetime, it gained interest a century later, in the 1900s. He also published about a dozen books about mathematics under his real name, Charles Dodgson, being true to his primitive passion.

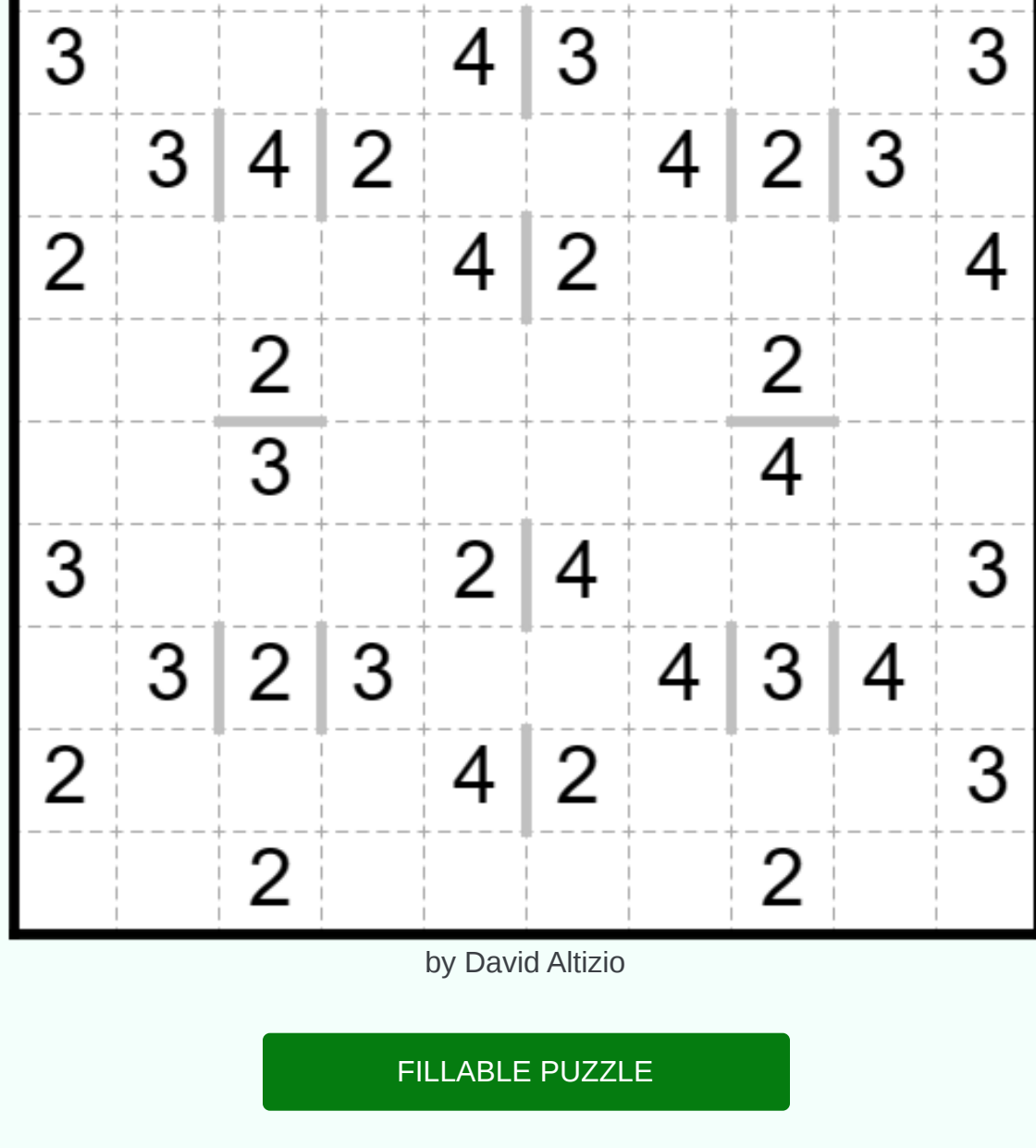
JANUARY PUZZLE:

FILLOMINO

January's Puzzle of the Month is of a type called Fillomino. This variant is a Mustang Math classic - last year's Mounting Mayhem Round was themed around the Fillomino Puzzle. If you enjoy this puzzle, we recommend you check that round out on [our website](#) by scrolling down.

The puzzle involves inserting numbers into the grid so that each number is part of a connected region of that many cells. More detailed puzzle rules can be found [here](#).

As a reminder, there are cash prizes for the students who solve all 12 months puzzles the fastest, so give it a shot and submit your answer once you're done!



by David Altizio

FILLABLE PUZZLE

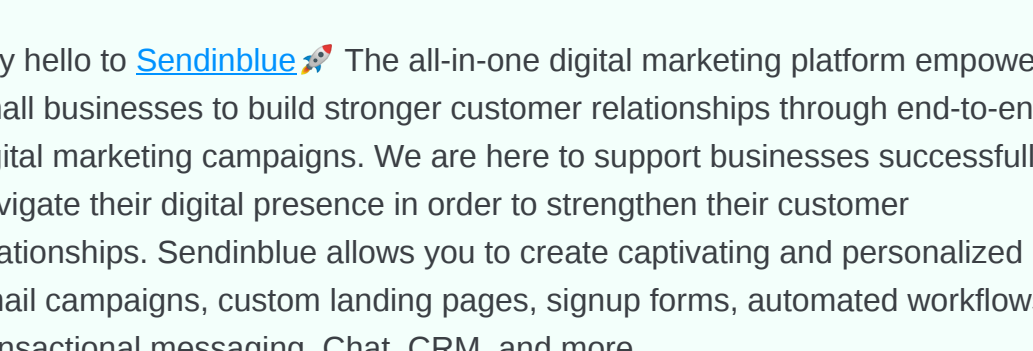
SUBMIT HERE!

RACING RIDDLE

I have a calculator that can display ten digits. How many different ten-digit numbers can I type using just the 0-9 keys once each, and moving from one keypress to the next using the knight's move in chess? (In chess, the knight moves in an L shape: one square up and two across, two squares down and one across, two squares up and one across, and other like combinations.)

SPONSORS

Here's a brief message from our sponsor Sendinblue! If you are interesting in sponsoring Mustang Math, please email us at: contact@mustangmath.com



Say hello to [Sendinblue](#)! The all-in-one digital marketing platform empowering small businesses to build stronger customer relationships through end-to-end digital marketing campaigns. We are here to support businesses successfully navigate their digital presence in order to strengthen their customer relationships. Sendinblue allows you to create captivating and personalized email campaigns, custom landing pages, signup forms, automated workflows, transactional messaging, Chat, CRM, and more

Join the Party: 500 million emails sent every day, 500K users in 180 countries, 10 years of expertise, and \$0 to get started on our [free account](#)!

Mustang Math
<https://mustangmath.com/>
contact@mustangmath.com

