Haycock Winter Break Mathcounts Bootcamp

Instructors: Justin Liu (Main instructor), Brandon Kong (Co-Instructor)

Course description: This class is a 4 day introductory course to Mathcounts fundamentals, targeted for students who qualify for Mathcounts regional tests. By the end of this course, we hope students will have a better grasp on the basic mechanics of problem solving. Throughout this class, students will master key topics like word problems, counting, probability, number theory, and geometry. Content ranges from simple, intuitive word problems and counting & probability basics to advanced geometry concepts. Our class can be challenging, but it should be accessible for all difficulty levels. The curriculum is specifically designed to keep students engaged, with fun, exciting lectures and collectable coins, making math feel like a game.

About your instructor: Hi, I'm Justin! I'm currently a TJHSST sophomore who has participated in many math competitions, such as CMIMC, ARML, Stanford Math Tournament, Mathcounts, Math League Nationals, etc. I've participated since I was a kid, and now I'm trying to innovate math education for the newer generation. Specifically, I'm trying to make math fun again, because it's one of the most frustrating subjects to study. I have recognition such as USACO Silver, Honor Roll on the AMC 8 twice, Mathcounts 25% of NOVA chapter twice, Math league nationals, and a top 7 ranking on Longfellow's Math Team. To me accomplishments don't set me apart, it's my passion for teaching and my previous experience teaching math classes that makes my class unique. I've received great

testimonies from previous students and I genuinely care about each one, because I know what it's like to struggle with math. I hope you enjoy my class!

Logistics

Location

Dolley Madison Library

Address: 1244 Oak Ridge Ave, McLean, VA 22101

Classes

Either 2-4PM (Days 2 and 4) or 7-9PM (Days 1 and 3)

2 hours in duration

Class Structure

0-10 mins: Warmup

10-45 mins: Class Concept + Practice

45-60 mins: Starting on Practice Questions + Review as we go

60-65 mins: Break + Snack

65-110 mins: Practice Questions OR Practice Test

110-120 mins: Wrap up, possible final quiz

Required Materials

Pencils, scratch paper, notebook, a good attitude :)

Printouts will be covered

Disclaimer

Please note class structure is subject to change and not all content may be covered due to time restrictions or a mismatch in skills. I will do my best to pace along with the students and to keep it under the time limit, though out of class review may be useful.

Day-by-Day Schedule

Day	Class Content	Time
Day 1: Problem-solving strategies, logic, and word problems	Elimination, pattern recognition, diagrams, translating words to equations	Thursday, Dec 18, 2025 7:00–9:00 PM
Day 2: Number theory fundamentals	Divisibility rules, primes, remainders, GCD and LCM tricks	Sunday, Dec 21, 2025 2:00–4:00 PM
Day 3: Combinatorics + Probability	Casework, complementary counting, simple probability, expected value	Saturday, Jan 3, 2026: 2:00–4:00 PM
Day 4: Geometry basics + comprehensive review	Basic angle chasing, triangles, polygons, coordinate bashing, full practice test	Sunday, Jan 11, 2026 7:00–9:00 PM

Classwork / Homework

Because of the short length and nature of this course, no formal homework will be assigned. However, students are encouraged to review questions on the solutions key on the website: chick1n.github.io/EJAcademy.

I write most of all the questions, so there may be wording/answer mistakes. If there are any issues, please email Justin at Justin Liu for guidance or to report mistakes. WeChat is also an available method for communication. We aim to avoid excessive homework and family arguments, and want to provide a peaceful out-of-class experience for both students and parents. If a student is unsure about a topic, they

can come to the office hours after the session or schedule a private meeting with the instructor. Please note availability may be limited.

IMPORTANT: Extra problems and challenge questions are ONLY for enrichment, and solving all of them is NOT expected and NOT recommended. Many of the questions are written to push the skillsets of the strongest students with extremely developed logical thinking, not for the average audience.

EJ Tokens + Rewards

In our class, our main goal is to make learning math genuinely enjoyable, so I have made a system that rewards students for great performance. Completing homework, doing boss questions, scoring well on quizzes, and completing classwork will award students tokens. However, incomplete homework, disruptive behavior, and guessing can result in the loss of your tokens. These coins can be traded in for a table of prizes or awards, which will incentivize students to complete their work and stay focused. At the end of 4 classes, the students who scored the most total tokens over the course of the class will gain a special prize.

Bonus/boss problems will award more tokens than average problems, which act as a great way to practice critical thinking.

Below are possible redeemable prizes (subject to change):

Reward	Token cost

Hint	2 Tokens
30 second break outside	5 Tokens
Selection of snack	5 Tokens
3d printed toy	6 Tokens
Rubik's cube or origami creation	10 Tokens
Double-or-nothing flip	Any amount

Class Expectations + Prerequisites

Although we support an inclusive learning environment, we make sure that all students are given fair attention. We want to create a fun environment where kids want to work, instead of having them despise the class. Each student should genuinely want to learn when they walk in.

Prerequisites: A strong foundation in prealgebra and a great learning mindset is required for this class. We will cover and explain mathematical concepts such as modular arithmetic, units digits, combinatorics operators, and exponential functions. Prior knowledge of math competition tricks aren't required. For any questions or an evaluation of your child's skill level, please email Justin Liu.

Extra Practice + Enrichment

Our class is generally considered short, and I do not have as much time as I want to dive into the topics, so improvements will arrive. I plan to roll

out self-written practice questions on my website for practice, but that may take time and is not guaranteed to be added. I'd also highly recommend the AoPS series of math books, as well as the online website Mathdash. One advice I have for parents is to not push your kid beyond their limits, and understanding math can be frustrating at times. I am available for help sometimes and may open up other classes (e.x. programming) or add tutoring availability, but those are just future plans.