Walter Johnson Mathematics Team

Welcome To The Walter Johnson Mathematics Team!

- ▶ We're so excited to start this year engaging in maths with you!
- ▶ Today, we're going to start by introducing our officers and our schedule for this Fall Season.
- ▶ Finally, we're going to do our first mini-problem set today, which will act as a diagnostic for us to measure where we should focus our time the most.

But First - What Does WJMT Even Do?

We primarily have our schedule split up into three main sections, in order of importance:

1. **Competition Mathematics**
2. **Higher Mathematics Exposure**
3. **Miscellaneous Mathematics**

Although we will primarily be preparing for mathematics competitions, we will take "competition maths breaks" every few months and explore an area of post-high school mathematics.

Why Should I Join WJMT?

There are so many reasons you should join WJMT, but the largest three are below.

1. **Competitive Math has beautiful nuance that is genuinely fascinating.** If you stick with us, you will gain a very deep appreciation for problem solving.

2. **Competitive Math will make your math class in high school easier.** The kind of rigorous problem solving we do here is a lot more nuanced than plug-and-chug maths classes in High School. Once you get a feel for what we do here, you'll realize what you do in your HS maths classes is generally simple.

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3. **Want to go Science post-High School? Competitive Math performance goes a long way.** Let me tell you a story about an MIT admissions officer.

What Is Competition Mathematics?

Competition Mathematics is, in short, a ton of fun! We will prepare for a variety of mathematics competitions, including the following which we will participate in:

- ▶ AMC/AIME
- ▶ ARML
- ▶ MOCO Mathematics League
- ▶ Purple Comet
- ▶ ZIML
- ▶ UMD Math Exam

As well as some we may or may not participate in:

- ▶ HMMT
- ▶ CMIMC
- ▶ PUMaC

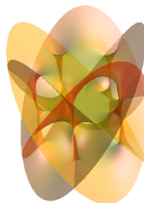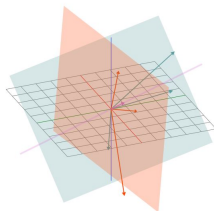# What Is Competition Mathematics?

The content differs slightly from competition to competition, but we will cover almost everything there is in AMC-level competition mathematics. A short list is the following:

- ▶ **Algebra**: Vietta's, Simon's, Nested Radicals, Geo/Arithmetic Series, Logarithms, Recursion, etc.
- ▶ **Geometry**: Angle Bisector, Mass Points, Stewart's, PoP, Synthetic Geometry, etc.
- ▶ **Complex Numbers**: Euler's, De Moivre's, RoU, Order, Complex Geometry, etc.
- ▶ **Number Theory**: Modular Arithmetic, FLT, Prime Numbers, Chinese Remainder Theorem, etc.
- ▶ **Combinatorics**: Pascal's Triangle, Choosing, BWA, Stars & Bars, Generating Functions, States, etc.
- ▶ **More!** Intermediate Inequalities, Functional Equations, etc.

What Is *Not* Competition Mathematics?

When we're not looking at competition mathematics, we'll be looking at getting a feel for post-high school mathematics, which includes, but is not limited to:

- ▶ **Group Theory** is a fundamental tool used to analyze abstract algebra.
- ▶ **Topology** is a rigorous yet abstract way of analyzing structures of sets.
- ▶ **Linear Algebra** is the language of all computational science.

What Is *Not* Competition Mathematics?

And we'll look at some interdisciplinary subjects:

- **Feminism Club Crossover Presentation**: Looking into historical and modern effects of maths environments.
- **Physics Club Crossover Presentation**: Physics and Maths are brother and sister. Has some great connections to Topology!

Some Advice

Before we jump into the amazing year we have planned for you guys, there's some advice that we wish that we were given back when we started competitive math:

- **The "Smartest People" are the ones who have gotten the most problems wrong.** They push themselves to learn from what they do not understand, and expose themselves to unfamiliar problems.

- **All of you are capable of becoming very good at competitive math.** Yet half of you will drop out within the next month. There are a variety of reasons for this, and most of them are OK. Some of them are not.

- **Leave your ego at the door.** The point of this team is to learn *a lot* of math. If you want to do that, you have to see a lot of things that you didn't know before. At WJMT, you compete against yourself, not those around you.

Questions?

Reach Out!

If you have questions about anything outside of meeting times, reach out to us on Discord!

Diagnostic And Problem Set # 1

Let's begin!
Feel free to ask any of the officers any questions at any point,
and discuss with your tables if you have any questions or if
someone else has a question!