



# GIRLS IN CONTEST MATH: MY EXPERIENCES

Isabella Quan  
July 3, 2022

 **MOMENTUM  
LEARNING**

# Girls in Contest Math



**Isabella Quan**

MIT '26

**July 3 (Sunday) 7-8PM CT**

**Girls in Contest Math**

RSI Scholar and Rickoid of the Year

MOP Qualifier

8-time AIME Qualifier/7-time MPfG Qualifier

IEEE CCWC Best Paper Awardee

# Achievements

- MOP qualifier (2020)
- RSI Scholar + Rickoid of the Year (2021)
- 2x USA(J)MO qualifier (2020-2021)
- 8x AIME qualifier (2015-2022)
- PUMaC Individual Finalist + top 10 Algebra
- Top 10 at MATHCOUNTS State (2018)
- 2x Math Prize for Girls Honorable Mention (2018, 2019), 7-time qualifier (2015-2021)
- On the winning team for HMMT November (2018) and February (2022)
- Captain of the Texas ARML Gold team, which placed 2nd (2022)



# Math Contest Cycle



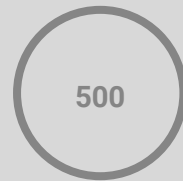
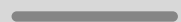
**AMC 10/12**

25 question, 75 minute multiple choice exam. Scoring highly (around 90 for AMC 12, 100 for AMC 10) qualifies for AIME.



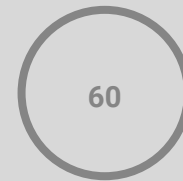
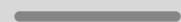
**AIME**

15 question, 3 hour short answer exam. Scoring highly on both the AIME and AMCs qualifies for the USA(J)MO.



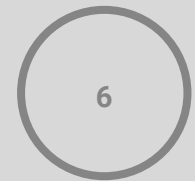
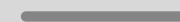
**USA(J)MO**

6 question, 9 hour proof-based exam (split over two days). Extremely difficult: scoring high qualifies for MOP.



**MOP**

Math Olympiad Program, a free camp that trains students for the IMO and beyond.



**IMO**

International Mathematics Olympiad. Needs little introduction.



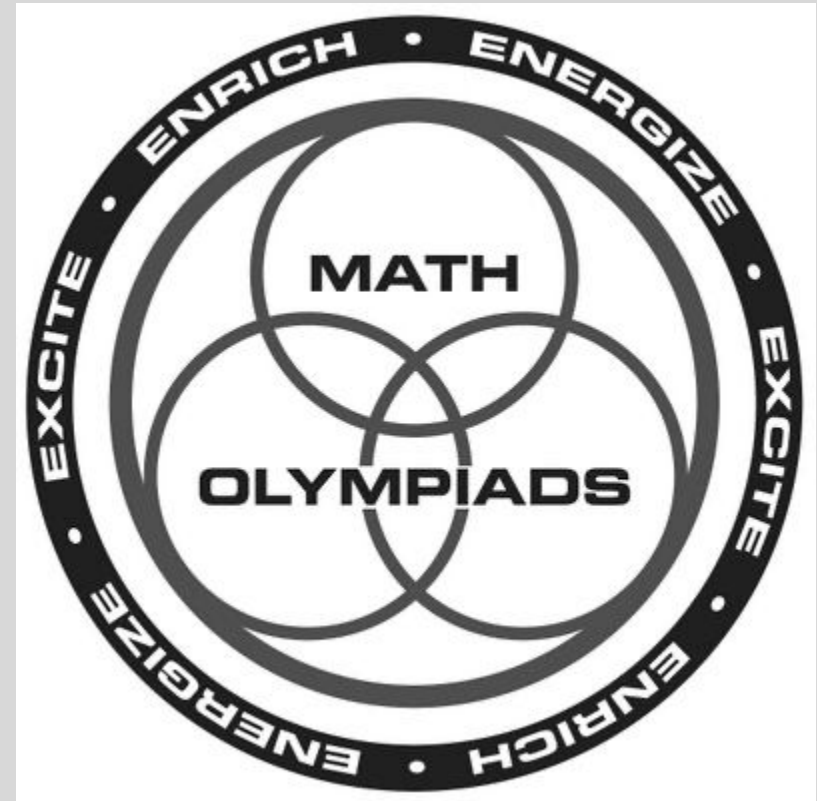
# My Story

A Look Back at 9 Years of Math

# Humble Beginnings (2013-2014)

- I had always liked math, but never realized that math contests existed.
- Officially began in 3rd grade with MOEMS, igniting my interest in contest math
- Really enjoyed it! I began studying math more extensively afterwards with AMC 8/10. I would go to a library after school and study AMC 8 or 10 problems.
- Did well on AMC 8, but was completely humbled by the 10.

*Recommended contests: MOEMS, AMC 8, Math Kangaroo (?), AMC 10*



# A New World (2015)

- I went from the 10 -> 12 this year: for whatever reason, complex numbers/logarithms/trigonometry came to me very easily, so I figured I would go for it (not even for AIME-making reasons, I just liked it more).
- Thanks to a lucky guess, I made AIME with a score of 102 on the AMC 12. This opened up so many new opportunities, as I grew to learn more about the math contest world.
- Got to meet the math kids in my local city including another girl around my age! That was how I joined the Austin Math Circle.
- i also learned who Luke Robitaille was at this time and was humbled very quickly

A bee starts flying from point  $P_0$ . She flies 1 inch due east to point  $P_1$ . For  $j \geq 1$ , once the bee reaches point  $P_j$ , she turns  $30^\circ$  counterclockwise and then flies  $j + 1$  inches straight to point  $P_{j+1}$ . When the bee reaches  $P_{2015}$  she is exactly  $a\sqrt{b} + c\sqrt{d}$  inches away from  $P_0$ , where  $a, b, c$  and  $d$  are positive integers and  $b$  and  $d$  are not divisible by the square of any prime. What is  $a + b + c + d$ ?

- (A) 2016    (B) 2024    (C) 2032    (D) 2040    (E) 2048

the problem in question!

# The Dive... (2016-2018)

- In middle school, I took contest math more seriously
- MATHCOUNTS was my biggest focus, and I dreamed of being on the state team. While I never got there, at least I got a trophy.
- It was a great few years for my school too!
- Also went to MPfG (more details later), HMMT, and PMWC, and made so many friends there.

*Recommended contests: MPfG, MATHCOUNTS, MMC, AMC/AIME*



# ...and the Plunge (2016-2018)

- My biggest issue was my fear of hard problems: the skills I had built up allowed me to keep making AIME, but never hop that gap to USA(J)MO, unlike some of my peers
- Missing out on MATHCOUNTS Nationals was also pretty rough
- I also had a pretty big ego problem around then too, despite my somewhat subpar performances.



# The Brink (2019-2020)

- Arriving at high school, my MATHCOUNTS days were behind me.
- Had two successful stints at Math Prize for Girls, as well as a great run at HMMT November, but failed once again to make USA(J)MO (which I attest to testing anxiety)
- I was legitimately considering quitting in 2020, and was pretty sure the AIME would be my last time, but...



# The Breakthrough (2020-2021)

- ...I made USAJMO, and then MOP! Though MOP was virtual, I made a lot of friends regardless, especially with the other girls in the program (known as Pre-MOPpers).
- This was followed by successful stints at HMMT and PUMaC (as well as making USAMO), as well as me getting into RSI!
- Everything was virtual due to COVID, but I'm still very grateful for my experiences.



can you see me?

# The Summit (2021-2022)

- College applications: only applied to MIT and Harvard. Had a very quiet 2nd semester of senior year :)
- Participated in the Curious Cube!
- Performed well at CMIMC, HMMT, and ARML, all fun team contests that I got to hang out with people with.
- Finally got a break :)

 **MAA AMC**  
American Mathematics Competitions

# THE CURIOUS CUBE

AN AMC STUDENT PODCAST  
SERIES PREMIERE JANUARY 2022

WITH HOSTS:

 **Isabella**  **Holden**  **Luke**

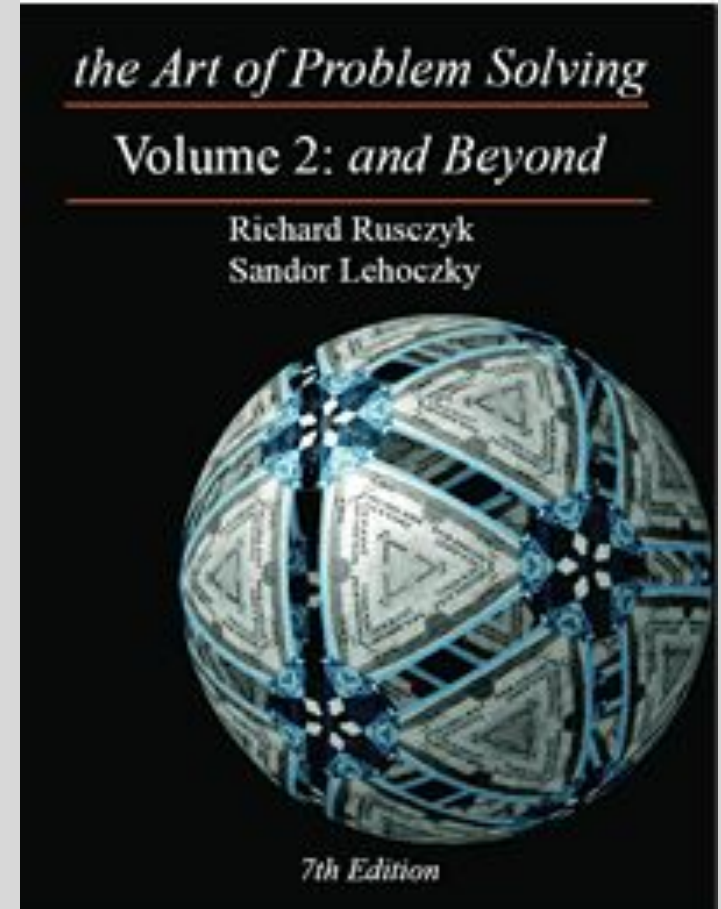
SUBMIT YOUR QUESTIONS AT [MAA-AMC.ORG/CURIUSCUBE](https://maa-amc.org/curiouscube)



# Reflections

# Camps? Resources?

- #1 advice is to do problems, lots and lots of problems.
- Books: pretty much all AoPS books are great, Vol 2, EGMO
- Camps: Mathworks! I don't have too much experience with other camps.
- Classes: AoPS classes are eh, OTIS is fine, in general look for small Zoom classes, Athemath!
- Practice? Burnout? Taking breaks?



# Math Not For Girls?

- I initially didn't notice the gender disparity in math.
- Slowly I watched other girls quit, for various reasons that I didn't understand til much later. At times I would be the only girl in a room or on a team.
- I faced more scrutiny after making MOP.
- Why do girls leave math?  
Loneliness, maturity, sexism.



# Math Prize For Girls!

- Math Prize for Girls! An excellent and challenging contest for the top 300 girls in the US, held at MIT.
- Overall an incredibly fun experience, and possibility of CASH PRIZES
- It can be a bit pricey and a big commitment, but it's overall super fun.
- Good for college (??)



# Extra Photos!



# Conclusion

- Math contests are incredibly fun, and a great way to meet new people – and the gender gap is growing smaller and smaller!
- However, math isn't for everyone.
- Scores are important, but focus on improving year by year, and thinking about what it is you need to improve.
- Resources aren't everything, though they are important. Passion is the most important.
- Overall, have fun :)



# Q&A

# Momentum Learning Wechat Group



All seminar recordings and slides can be found at: <https://www.momentumlearning.org/open-house>

Join Momentum Learning Wechat groups



# MOMENTUM LEARNING

www.momentumlearning.org  
info@momentumlearning.org



- ◆ **Best** contest math and coding competition (USACO) preparation classes
- ◆ **Structured curriculum** from the elementary level to the highest Olympiad Math (IMO/USAMO)
- ◆ We use **Zoom** to live-stream classes. **Recordings** are available
- ◆ Over **200** students receive **Distinguished Honor Roll** (top 1%) and **Honor Roll** (top 5%) on AMC8, including **15-20 perfect scores** each year
- ◆ **MATHCOUNTS National** individual round **winner, runner-up**, and multiple students who made **count down** (top12). Team round **National Champion** 3 years in a row
- ◆ Each year, over **260** students qualify for **AIME**, over **60** qualify for **USAMO & USAJMO**, and **4-8** qualify for MOP
- ◆ Team Sweepstake Winner for **CMIMC, HMMT, and PUMaC**
- ◆ Over **50** students qualified for USACO **Gold/Platinum** in last 2-3 years
- ◆ Trained the **2nd place** team in **National Science Bowl** and students who made **USABO Finalists** (Top 20 in the country)

## MOMENTUM LEARNING

www.momentumlearning.org  
info@momentumlearning.org



Scan me to register

### Senior Seminars

Register here:  
https://www.momentumlearning.org/open-house



**Jarvis Xie**  
Yale '26

**June 17 (Friday) 7-8PM CT**

**How to become a top debater**

Peak at Rank #1 among all LD debaters on multiple national metrics  
USAMO Qualifier  
USACO Platinum Qualifier

**June 18 (Saturday) 7-8PM CT**

**USACO Practice and Strategy**

2-time USACO Finalist  
USAMO Qualifier  
Competitive Programming Initiative Founder



**Daniel Guan**  
MIT '26



**Rowechen Zhong**  
MIT '26

**June 19 (Sunday) 7-8PM CT**

**Learning to Learn: How to Master three Arts**

US Physics Team '22  
Blue MOP '21  
USAMO HM '21  
USACO Platinum

**June 24 (Friday) 7-8PM CT**

**Science Olympiad and Social Impact**

RSI Scholar  
Coca-Cola Scholar  
3-time Science Olympiad National Champion  
3-time USABO Semifinalist



**Stephanie Wang**  
Harvard '26



**Russell Li**  
Harvard '26

**June 25 (Saturday) 7-8PM CT**

**Crafting a Productive & Enjoyable HS Career**

RSI Scholar  
5-time Scholastic National Gold/Silver Medalist  
Editor-In-Chief of School Newspaper  
Captain of Varsity Cross Country & Tennis Teams

**July 2 (Saturday) 7-8PM CT**

**ASK ME ANYTHING!**

3-time IMO Gold Medalist  
USA IOL Team Member  
Regeneron Science Talent Search 10th Place  
2-time MATHCOUNTS champ



**Luke Robitaille**  
MIT '26



**Isabella Quan**  
MIT '26

**July 3 (Sunday) 7-8PM CT**

**Girls in Contest Math**

RSI Scholar and Rickoid of the Year  
MOP Qualifier  
8-time AIME Qualifier/7-time MPFG Qualifier  
IEEE CCWC Best Paper Awardee

**July 9 (Saturday) 7-8PM CT**

**Preparing for USABO and Regeneron**

Regeneron STS 3rd Place Winner  
RSI Scholar, Top 5 Paper & Presentation  
2-time USABO National Finalist  
ISEF Grand Prize Winner



**Amber Luo**  
MIT '26



**Nicholas Wei**  
MIT '26

**July 15 (Friday) 7-8PM CT**

**My Science Research Journey**

ISEF Grand Prize Winner  
CSEF Project of Year  
USABO Finalist  
Paid Research Intern at Stanford

**August 13 (Saturday) 7-8PM CT**

**Balancing Academics and Athletics**

4-time AIME/MPFG Qualifier  
Maryam Mirzakhani AMC10 Winner  
Speedo Sectionals Qualifier  
ULL Swimming District Champion



**Christine Huang**  
MIT '26

2442 Settlers Way Blvd  
Sugar Land, TX 77479

**281-277-9075**

Thank You!