New York Math Circle Spring 2017 Newsletter

10th Anniversary

In this issue

Challenge Yourself!

1. **MS A** In how many ways can you arrange the letters of the word PHILADELPHIA?

2. **MS B** Why is the alternatiing sum of the numbers of any row of Pascal's Triangle 0? For example $1 - 4 + 6 - 4 + 1 = 0$

3. **MS C** What divisibility rule does this picture illustrate?
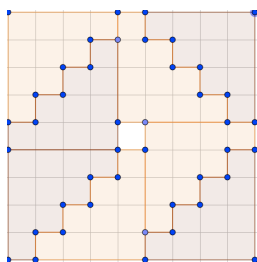
4. **HS A** A triangle has sides of length 6, 8 and 10. Compute the distance between the center of the inscribed circle and the center of the circumscribed circle.

5. **HS B** Alice, Bob and Carol repeatedly take turns rolling a die taking turns, Alice going first, followed by Bob, followed by Carol. What is the probability that Carol will be the first one to roll a 6.

Director's Report

Dr. Kovan Pillai

Welcome to New York Math Circle's third newsletter!

This semester, we are happy to welcome **Amy Lee** to our faculty. Amy is a teacher at NEST+m and has also worked for NYMC as a substitute in prior semesters. She is teaching the MSA class at Queens College. Spring 2017 has been a time of significant expansion - enrollment reached 426 students, the first time we have exceeded 400. We expanded our Middle School offerings on both Saturday and Sunday, while adding a class to our Queens program. We also launched our new College Bridge program, filling a gap between High School and College for our most advanced students. The class has been well received and we plan to continue it in the Fall. Summer registrations were also very strong this year, with 300 students applying to fill 120 places.
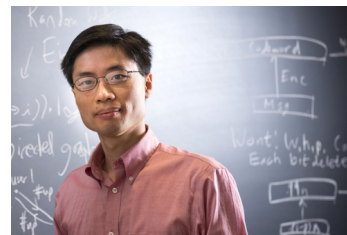
Amy Lee

To celebrate our **10th anniversary**, we will be hosting two distinguished speakers on August 4: Professors **Arthur Benjanmin** and **Po-Shen Loh**. Most past and present staff will be attending and there will be time to chat over snacks prior to the talks. We hope you can join us!

Dr. Arthur Benjamin   Dr. Po-Shen Loh

Support Us!

We strive to make our program affordable and have not raised our Fall and Spring fees in two years. Please become a supporter and help keep costs fixed for another year. As we expand, we also look for volunteers to help in any way - if you are interested in contributing time to our community, please sign up as a volunteer - we can always use an extra pair of hands!

DONATE NOW   **VOLUNTEER NOW**

Challenge Yourself!

6. **HS B** On a plane there are $2n$ points (n red and n blue). Prove that it is possible to draw n line segments so that the endpoints of each line segment are different colors and no two line segments intersect.

7. **HS C** A gecko and an anti-gecko take a random walk on the faces of a cube, starting on opposite faces. How long, on average, will it be before the geckos walk onto the same face of the cube and annihilate each other?

8.**HS C** Three circles are tangent to a line and pairwise externally tangent to each other. A fourth circle is externally tangent to each of the other three circles but does not meet the line. Find the distance from the center of the fourth circle to the line, if the radius of the fourth circle is 1.
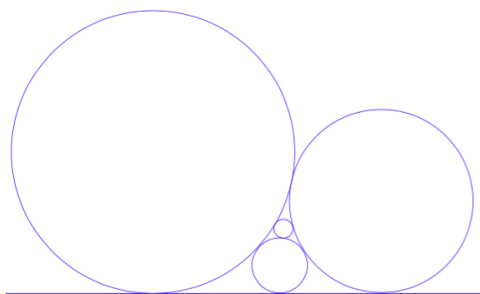
9. **College Bridge** Prove that an increasing bounded sequence has a unique limit.

10. **College Bridge** Prove that $\sqrt{2} + \sqrt{3}$ is irrational.

Alumni News

Serina Hu

Alumni Spotlight - Serina Hu

by Alison Aun, NYMC Program Manager

We would like to congratulate our alumni spotlight, Serina Hu, on her acceptance to Harvard College for the Fall semester. Serina will also join our 2017 Summer HS Program staff as a Teacher's Assistant. She is currently a senior at Hunter College High School, captain of both Hunter's math team and the NYC math team, and has qualified for USAMO these past two years.

Serina became fascinated with mathematics when she first joined Mark Twain's math team and participated in Mathcounts. She was intrigued to learn how mathematical word problems helped her to "think outside the box" and apply what she'd learned in class in innovative ways. Serina continued to explore her interest through New York Math Circle, Art of Problem Solving, Math-M-Addicts, Hunter College High School and math camps (Idea Math, Canada/USA Mathcamp). She participated in many math competitions with the New York City Math Team (AMC/AIME/USAMO, NYCIML, NYSML/ARML, HMMT, PUMaC, Purple Comet), and volunteered at Mathcounts as a grader. She also felt the annual contest held every fall at MIT called Math Prize for Girls to be "especially influential" for her as she was able to casually engage with new people about problems.

Serina first joined New York Math Circle in the summer of her 8th grade year in 2013. She was accepted to our HS Summer Program - Level C with Mr. David Hankin and Mr. Stan Kats. Serina found "the class greatly expanded my knowledge and my interest in mathematics." "I really enjoyed the camaraderie between the students and the teachers and the way that Mr. Hankin and Mr. Kats were always available to answer questions about the topics we were going over. Math Circle was the first place that I met the math community outside Hunter for an extended period of time as well, and I would see many of my classmates at other programs and contests in the future."

Although Serina is passionate about math, she also likes to play piano/flute, listen to music, do computational chemistry research, code, play games or watch anime.

We would like to wish Serina the best at Harvard!

Alumni News (cont.)

The following alumni responded to our **online survey** - if you want to be included in our next newsletter, please contact us.

Brian Riedel, an alumni of NYMC from 2009-2011, is now studying at Carnegie Mellon University. He received honorable mention in the last two years at the William Lowell Putnam Mathematical Competition. He has also participated in multiple math competitions including ARML, NYSML, USAMO, AIME, Putnam Exam (in college), PUMaC and Virginia Tech Competition.

Max Fishelson, former NYMC student during the period 2010–2015, graduated from Stuyvesant H.S. and has been attending MIT since September 2016. He participated in multiple math competitions including ARML, NYSML, USAMO, USAJMO, AIME, Local MATHCOUNTS, Chapter MATHCOUNTS, State MATHCOUNTS, NYCIML, NYML, HMMT and PUMAC. Some of Max's recent achievements include being qualified for USAMO in 2015 and 2016, co-captain of NYC and Stuyvesant's math teams from 2014–2016, and co-captain of the nationwide ARML math team, winning 7th place in 2015.

Zachary Marcone, a current student at Columbia University, participated in NYMC's HS Summer Program in 2013. He participated in AMC, the Suffolk County Math Contest, and the Suffolk County Math Tournament. Congratulations to Zachary on receiving the Rabi Scholar at Columbia University, the most prestigious math/science undergraduate recognition in the institution.

Adam Granger, a student at NYMC from 2013–2016 started attending Manhattan College in Fall 2016. Some of his notable achievements include the National Honor Society, Lasalle Honor Society, and Presidential Merit Scholarship at Manhattan College.

Congratulations to **Alisher Khodjaniyazov**, a student at Brooklyn Studio Secondary School, for winning 2nd place in the Tashkent District Math Olympiad. He was enrolled at NYMC during 2014–2015, stating NYMC HS Summer Program was "one of the best math experiences I had in my life. You are surrounded by people who love math every day for more than 5 hours." Best of luck at Stony Brook University!

A current student at MIT and alumni of NYMC (2011-2012), **Justine Jang**, participated in in ARML, AIME, Local MATH-COUNTS, Chapter MATHCOUNTS, and State MATHCOUNTS.

Previously a student at NYMC in 2011, **Edward Fan** graduated from Trinity H.S. and started attending MIT in the Fall of 2016. Edward participated in AIME, Local MATHCOUNTS, Chapter MATHCOUNTS, and State MATHCOUNTS competitions.

Best wishes to **Dessie DiMino** for her acceptance to CalTech in the Fall of 2016. She was a NYMC student in 2011–2012, and participated in the Local MATHCOUNTS competition. Dessie plans to major in computer science at CalTech. She was involved in the Garcia MRSEC summer research program, an Intel Semifinalist (Tissue Engineering) and attended the Girls Who Code Summer Immersion Program.

Congratulations to **Joseph Mogrovejo**, alumni of NYMC in 2011, for his acceptance to CUNY Hunter College!

Current Students News

Congratulations to our NYMC mathletes! Based on responses to a recent online survey, the following NYMC students excelled in local, regional and national math competitions:

Math Kangaroo: Adi Vidur

Purple Comet: Danielle Zhong

KSEA NMSC:

Local MathCounts: Christopher Yang, Renee Yang, Jason Huang, Alexander Loo, Danielle Zhong

State MathCounts: Adi Vidur, Calvin Aw

Chapter MathCounts: Jerry Wang, Ahmed Shekhani

SBIMC: Adele Smolansky

NYSML: Alex Lu, Danielle Zhong, Calvin Aw

NYML: Maxwell Feiner, Alex Lu, Adele Smolansky, Ahmed Shekhani

AMC8: Jason Huang,

AMC10: Paul Gutkovich

NYCIML: Alex Lu, Adele Smolansky, Calvin Aw

AIME: Alex Lu, Paul Gutkovich, Calvin Aw

Other: Danielle Zhong (Silver Medalist at Greater Metropolitan New York Math Fair), Paul Gutkovich (Continental Math League, 1st Place)

Keep up the good work!. We know there are many more accomplished students out there - if you wish to be included in the next newsletter, please respond to our next online survey.

Summer Plans

Registration for the **2017 Summer Middle School Program** is now open! You can register here: