

I was first exposed to discrete mathematics through high school competitions. What really spoke to me about it was its elegance. For a synthetic geometry problem or inequality on an Olympiad, it helped to know various esoteric tricks, perhaps a named theorem I picked up from earlier training sessions. But problems in combinatorics, graph theory, or number theory were usually solvable without the use of advanced theorems, and instead involved applying very elementary ideas in clever ways. For sure, many problems in combinatorics and number theory had long solutions, but behind most were elegant and beautiful ideas nonetheless.

At MIT, I have continued to pursue combinatorics. This past semester, I took Hyperplane Arrangements with Richard Stanley. I also carried out a small research project with Peter Csikvari through the MIT Undergraduate Research Opportunities Program (UROP). I proved some results on tree homomorphisms, and got a small glimpse into what research is like. I look forward to doing more research in the future, including continuing to work with Dr. Csikvari this semester. Furthermore, I have been making an effort to learn more discrete math outside of the classroom. Over the January term, I read through *Introduction to the Theory of Computation* by Sipser, and I find theoretical computer science fascinating. This semester I plan to take Discrete Analysis (a combinatorics reading course taught by Dr. Csikvari), Advanced Complexity Theory (a theoretical computer science course), and a couple of other math courses.

During the course of my high school mathematical Olympiad career, which included three great summers at the Mathematical Olympiad Summer Program (MOP) and culminated in a gold medal at the 2015 IMO, I encountered a bit of more advanced material. In my last year of MOP, the IMO team spent quite a bit of time learning some higher math. Furthermore, I was able to interact with some professional mathematicians, such as Po-Shen Loh, a combinatorialist and the head coach of the USA IMO team. My time spent doing math competitions and attending MOP and IMO has given me background which I believe I will find invaluable in mathematical research.

In terms of math competition results, I won USAMO with a score of 33/42 as a high school senior. I received a gold medal at the 2015 IMO with a score of 31/42, which placed me 10<sup>th</sup> in the world. I helped the United States team win the competition for the first time since 1994. I took the Putnam this year, but results are not out yet.

I am currently a first-year undergraduate student with sophomore standing at the Massachusetts Institute of Technology (MIT), and I recently declared mathematics as my major. I plan to graduate in 2019 and continue on to grad school and ultimately to academia in mathematics. I am enthralled by the prospect of spending years doing mathematical research. I am unsure which subfield of mathematics I want to make my life's work, but currently discrete math strongly appeals to me.