

2020, Mathematics, Trinity College

While I have tried my hands at a lot of different subjects, the only one that kept me really interested is mathematics. I spend most of my free time with this subject, solving problems or reading books like 'Problems from the Book' by Titu Andreescu. I can't imagine studying anything else at university and my goal is to do mathematical research after graduation. Since primary school I have been entering mathematics competitions, and I currently attend Veres Péter High School, one of the top 10 in Hungary. My best achievement was the absolute first place in the 12th Middle European Mathematical Olympiad in the individual category and a team bronze medal. I also participated in 2019, I got a bronze and a silver medal. In addition, I also won all the major national competitions in Hungary: OKTV (2019), Arany Dániel (2017), Varga Tamás (2015, 2016), Zrínyi Ilona (2017) as well as several others. In addition, with my school team I also won multiple international team competitions, the Náboj in 2018 and the Bolyai four times. Since 2016, I have been continuously training my problem-solving skills by submitting six problems to the B correspondence competition of the KöMaL mathematical journal every month, twice coming 3rd and once 2nd nationally. Based on these results, I have been invited to national and international mathematics camps, for example Maths Beyond Limits and PROMYS. The latter is a 6-week long camp in Oxford, where we built up number theory from scratch. We started from axioms, covered topics of continued fractions, quadratic residues, and investigated the arithmetic properties of several rings. In addition, we worked in a small group on an exploration project, where we got the topic of fractional linear transformations and needed to come up with something by ourselves. We investigated what kind of cycles arise under iteration of such functions on the field F_p extended by infinity. I really enjoyed this work because it felt like I was doing research. However, the camps that had the greatest impact on me were those organised by Lajos Posa. They are held three to four times a year, and they taught me how good it is to explore a topic by myself with only little help. We mostly worked on topics connected to combinatorics, for example finite and infinite Ramsey type problems, set theory like Russell's paradox, linear algebra and projective geometry; last time, we learned about algebraic topology and fundamental groups. In parallel, I have also attended IMO preparation classes and camps for 3 years, where we prepare for competitions mostly with IMO type problems. I really love the joint preparation camps with the English IMO team because we get insights into research with guest lecturers who present their own projects. Last year I attended extra classes with László Surányi, where we built up hyperbolic geometry from axioms. It was amazing to learn about this strange geometry and its statements, for example that a triangle can't have an arbitrarily large area or exploring that the parallel postulate is not provable from the other postulates. In addition, I am attending the Milestone Institute, where I studied calculus, analytic number theory and topics from abstract finite group and Galois theory with my mentor in English, as well as learning how to read academic texts and publications and write essays. At Milestone, I am a member of the Computer Sciences society where I learned coding in JavaScript and in C++. As a member of the Hungarian Templeton Program, for which 314 students were selected from close to 20,000 applicants, I had the opportunity to visit CERN, which broadened my interest in Physics. Afterwards, I started competing in Physics and won the Mikola Sándor national competition in 2017. I like physics topics with an interesting mathematical background, like quantum and modern physics. As for hobbies, I played handball competitively for 10 years and played the guitar for 5 years.