**AwesomeMath**

1. **What part of mathematics do you like most and why? What is your favorite problem in this area?**

I still remember, on a snowy day before Christmas, I was planning to decorate my cabin with some glass balls; however, before deciding to paste Santa Claus images into each face of the polyhedra, I was struggling in figuring out the exact number of pictures I need to buy. And, finally frustrated, I turned to my mother, who is a math teacher.

My mother took a full look at my glass ball. She firstly counted all the vertex of the polyhedra - 60 in total, and found that each vertices connects three edges. According to a basic mathematical axiom, every two points determine a straight line. Mum instructed me to solve my confusion this way: First calculate the total number of edges (60×3÷2 = 90), then try to find the number of faces (X) based on Euler’s Formula: Vertex (60) + Faces (X) - Edges (90) = 2. It’s concluded that I need to buy 32 pictures of Santa Claus.

Since then, equations re-establish my view of mathematics. I especially loved learning about Euler’s Formula for Polyhedra, V-E+F=2, and the discussion of different n-dimensional shapes - it was my introduction to topology. The number of faces, edges, and vertices of a solid satisfy such a simple relation that never alters on any condition. This succinct equation is the condensation of no less than twenty exacting proofs and countless calculation.

Equations were born in history. They were born with stories and became vivid. Euler spent three days approximating the orbit of a comet and only stopped when he lost his eyesight; Hippasus defended his discovery of irrational numbers until his death; Galois established the theory of field the night before he died in a duel for his lover.

Equations direct us to discover the unknown. Euler’s Formula helps produce surfaces and knots in material, saddlery, and the maritime industry. It sheds light on biological enzyme behavior and even explains why the motion of celestial bodies can be chaotic. Such equations transcend disciplines, carry knowledge from centuries past to the present, and shall lead scholars towards future developments.

1. **In the past year, what extracurricular activities were you involved in? Describe the nature and extent of your involvement. Which one is most important to you?**
2. Zhi Xing (UWC-CSC Signature Project): Volunteer Teaching in Henan (China), 2018; Team Leader

* Instructed a group of leftover children (6-to-8 graders) in Ruyan Hope School the subject of geography by inspiring them to map the outside world with imagination;
* Observed and logged the psychological development of pupils whose growth lacks parental companionship for their laboring in remote cities all year around.

1. National Final, China Thinks Big, 2019; Captain

* Assembled a team of members from different cities across China, and coordinated on-and-offline meetings to prepare for a research project;
* Studied the development of juvenile psychology in their growth, and proposed solution to improve the introverted mentality by applying Moritatherapy.

1. Third Prize (Chendu Division), Columbia University Social Science Research Training Workshop, 2019, Team Leader

* Interviewed 50 groups of students, conducted literature review of behavioral psychology, analyzed data for social media and advertising, produced an English paper: *How does targeted advertising on social media impact the behaviors of adolescent?*
* Honed research skills by attending intensive-reading lectures; studied topics of social justice, gender equality, and juvenile development; mastered new tools to analyze our contemporary social problems.

1. Kayaking, UWC-CSC Gym Session, three hours once a week.
2. **U-CODE Movement (girls’ coding), Principal Member**

* Self-study and peer-tutor Python; develop small CS projects with mastery of basic coding skills;
* Promote the education of girls’ coding with bilingual teaching, and empower girls from local secondary schools with coding skills to explore boundless potential in STEM;
* Develop women confidence, and break the stereotype and limitation of gender.

One year ago, I attended a NASA program to get a taste of the most advanced aeronautics technology in the world and to challenge myself with the hands-on programs. However, in my section, only six out of thirty participants were females while the male students constantly emphasized that they were “ready to help.” Even my teacher discouraged me from majoring in the CS program saying that “it’d be hard for the girls.” Moreover, male students outnumber their counterparts in every single STEM class I’ve taken. It’s hard to find support around me. Occasionally, I just can’t help but feel out of place.

However, none of this has stopped my desire to excel. Since my high school curriculum didn’t offer Computer Science, I signed up for an outside after-school class and self-studied Python.

Thinking of how many female students might share my experience, I decided to take another step further - assembling a team called U-CODE within school, ready to break down some stereotypes. “Everyone should learn to program a computer, because it teaches you how to think.” Steve Jobs’ words resonated with me. We then approached different organizations for sponsorship. After a month’s effort, a Shanghai-based company responded and generously sent us a teacher, with whom we studied two hours per week for free. After a semester of preparation, we started to provide coding courses to girls in local primary and middle schools with a bilingual instruction, aiming to stimulate young female students’ interest in STEM and enabling them to access educational resources outside of the Great Firewall.

Our first class project that I led was indeed about “penetrating the wall” - a collective effort.

Day 1: Requirement identification and framework set up.

Day 4: Visual Studio installed.

Day 18: Database migration completed.

Day 60: Data security with encapsulated security payload(ESP) done!

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Upon the project’s completion, we spent three days debating. Finally, we got its name: Papercraft. It would carry our hope like an aircraft, free and ambitious, into the distant sky.

Our influence has grown steadily ever since then, now 20 volunteers on board and over 100 students.