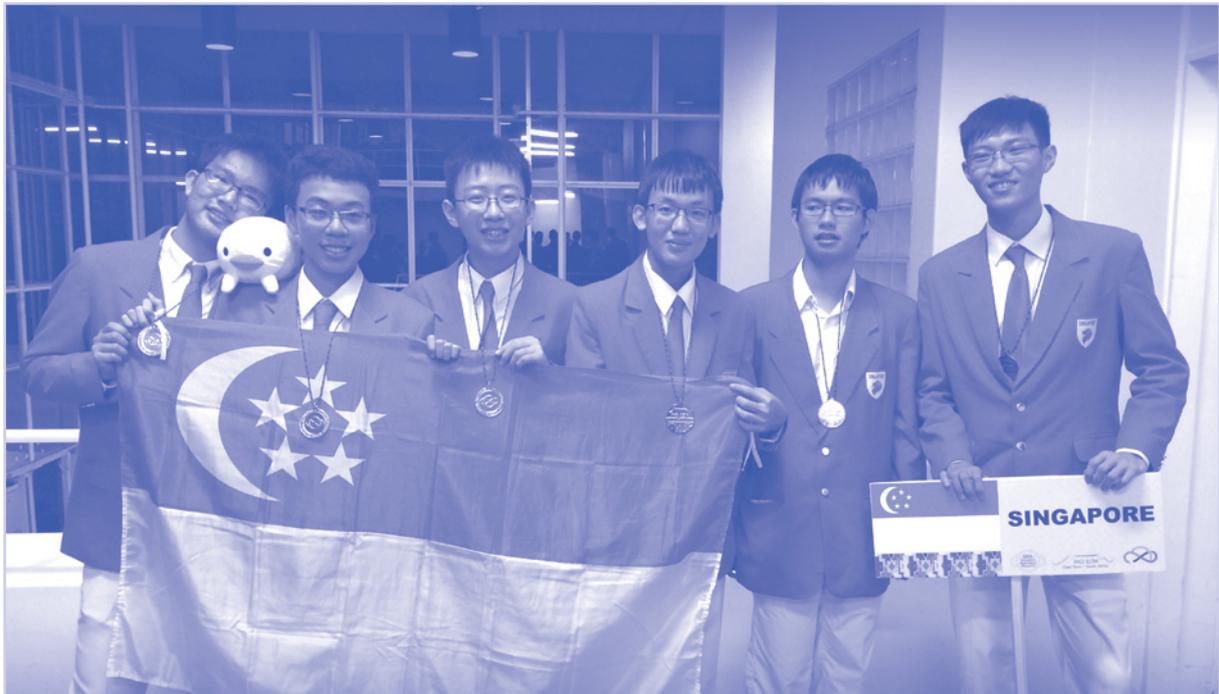


## Ten Questions for the SIMO 2014 Team

The Interviewer sat in his chair, surveying the five people seated across from him. They only knew him as the Interviewer, everyone did. At all the cocktail parties he was invited to, he simply introduced himself as the Interviewer.



*From left to right: Liu Yijia, Tan Siah Yong, Tan Sheldon Kieren, Toh Shan Hong Dylan, Ling Yan Hao, Lin Kewei David.*

Interviewer: Right, let's get started shall we?

The person on the left most, the one who some referred to as little egg (xiao dan!), cleared his throat.

"Wait, David's still not here," Sheldon said.

"He's always late," said Yan Hao.

"Come, try this hard problem," prompted a third person, Yijia, as he thrust a geom[etry] problem into Sheldon's face.

"Haha, this problem is trivial by [using] complex [numbers]."

The last two seated there turned to glance at each other. Then one of them, Dylan went back to staring at the other three, while Siah Yong, went back to writing a transcript of the interview.

As a holy chorus burst out into an aria, David sailed in on the backs of a thousand swans. The sound of twenty bowls of mushroom soup exploding filled the room.

“Alright,” now that everyone is here, let’s begin the interview,” the Interviewer said.

① *When and how did you first discover your special talent in mathematics?*

**Sheldon:** When I was around two years old, I found a keen interest in games involving simple mathematics such as snakes and ladders. This sparked my passion for mathematics, which I believe has also contributed to my aptitude in mathematics today.

**David:** I’ve always had an inclination for mathematics since young, but I only started paying serious attention to mathematics after my first Olympiad in P5.

**Siah Yong:** I first discovered my special talent for mathematics in lower primary when I learnt how to use the abacus. I found that sums came rather naturally to me and that I could work through problems quickly and in a logical manner, and from there I was introduced to competitive mathematics.

**Dylan:** My passion for Mathematics developed in lower primary. I first discovered my talent in Mathematics in Primary 4, upon realising that I could tackle problems of higher difficulty. After that, I started to repeatedly challenge myself with newer, harder and less intuitive problems.

**Yijia:** I started liking numbers when I was 4 and in primary school, I came across this math Olympiad book which had a particular matchstick problem which got me interested.

**Yanhao:** I do not remember when exactly I “discovered” this special talent. When I was six, my sister (two years older than me) had trouble with her multiplication tables. I remember my parents pasting a multiplication table poster on the wall. I memorised the table much faster than my sister did. I have another interesting story to tell. When I was nine, I had a rather interesting inspiration about division by zero. It was in a computer game, where completing a task would give you some random number of coins. I needed to collect 12 coins. If each completion gave me 3 coins, I will have to do the task 4 times. If I only get 2 coins, I will have to do it 6 times. If each completion of the task gave me nothing, how many times do I need to complete the task?

② *When and how did you start proper training for math competition/Olympiad?*

**Sheldon:** Proper training for me started when I was in Primary 6 when I entered the SIMO Junior Team. Before that, I did not have much experience with math Olympiad, or at least the kind of math Olympiad for secondary schools and beyond what we are all familiar with now.

**David:** P6, through my primary school (Nanyang Primary School).

**Yanhao:** I started proper training at eleven. My primary school teacher got me interested in it.

**Yijia:** When I was in P4, at the Primary Math Masterclasses. We had to do a math research project which involved counting triangles in a lattice.

**Siah Yong:** I started proper training in mathematics in Primary 4, when I joined the mathematics club in my primary school. There we would practice with some basic Olympiad questions and it was my first formal Olympiad training.

**Dylan:** I started proper training in Primary 5 for the International Mathematics and Science Olympiad (IMSO). The trainings are truly beneficial as they provide a variety of problems that require various concepts, some new, some reapplied in a different way. It opened a new world of Mathematics, one distinct from the content taught in school. Over the years I picked up new techniques, concepts, ideas and skills that further boosted my interest in Mathematics.

③ *Besides preparing for competitions, what else does the (SIMO) training teach you?*

**Sheldon:** SIMO training – and most math training in general – allows us to develop our problem-solving skills and other useful values such as resilience when we are stuck on a problem for a long time. We also learn interpersonal skills such as collaboration and teamwork when solving problems together.

**Siah Yong:** SIMO training also teaches me about the many different things that can be gained from Olympiad, like insights into how people react to problems and more effective problem solving techniques. In addition it has allowed me to meet many other like-minded people and interact with them.

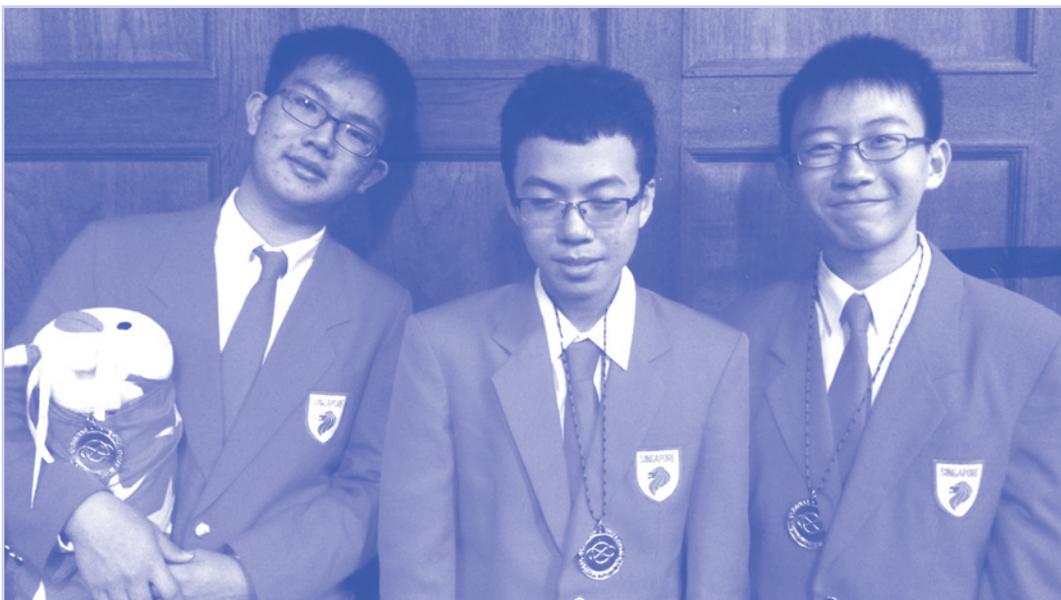
**Dylan:** SIMO has allowed me to make new friendships and bond with people with a common passion and flair for Mathematics, creating a conducive learning environment.

**David:** It teaches us how to troll others.

**Yijia:** It is a good opportunity to be independent.



Liu Yijia, Tan Siah Yong and Sheldon Kieren Tan were ranked 21st to 25th at the SMO (Junior) in 2010 (top).  
The trio became IMO Gold Medallists in 2014 (bottom)



4

*Do you learn from one another during training?*

**Sheldon:** Definitely. All of us have our own strengths and weaknesses in math Olympiad, such as our best and worst sub-topics. Thus we all have opportunities to learn from one another, especially at the end of the training sessions when we go through the solutions and take turns to present the problems that we attempted that day.

**David:** Of course. We all have the opportunity to present our solutions to the rest of the team during training, and from this we also learn a lot from others as they have a different style of thinking about problems.

**Siah Yong:** We do learn techniques from each other during trainings, as we take turns to present our solutions to the problem so we get a broader perspective as to the different methods of solving a problem.

**Dylan:** Yes. Everyone has their advantages and disadvantages, and it is only best that we learn from each other and share techniques and concepts. Learning others' thought processes may also help in providing new ideas and perspectives on a problem.

**Yijia:** Yes. I suck at combinatorics, and combinatorics requires the most insight. I have learnt from my teammates how to look at the problems from different points of view.

**Yanhao:** During training, we are given a set of problems to solve and those who got solutions will present to the rest. As we explain our solutions, we learn a lot from each other.

5

*Do you treat each other more like rivals or team members?*

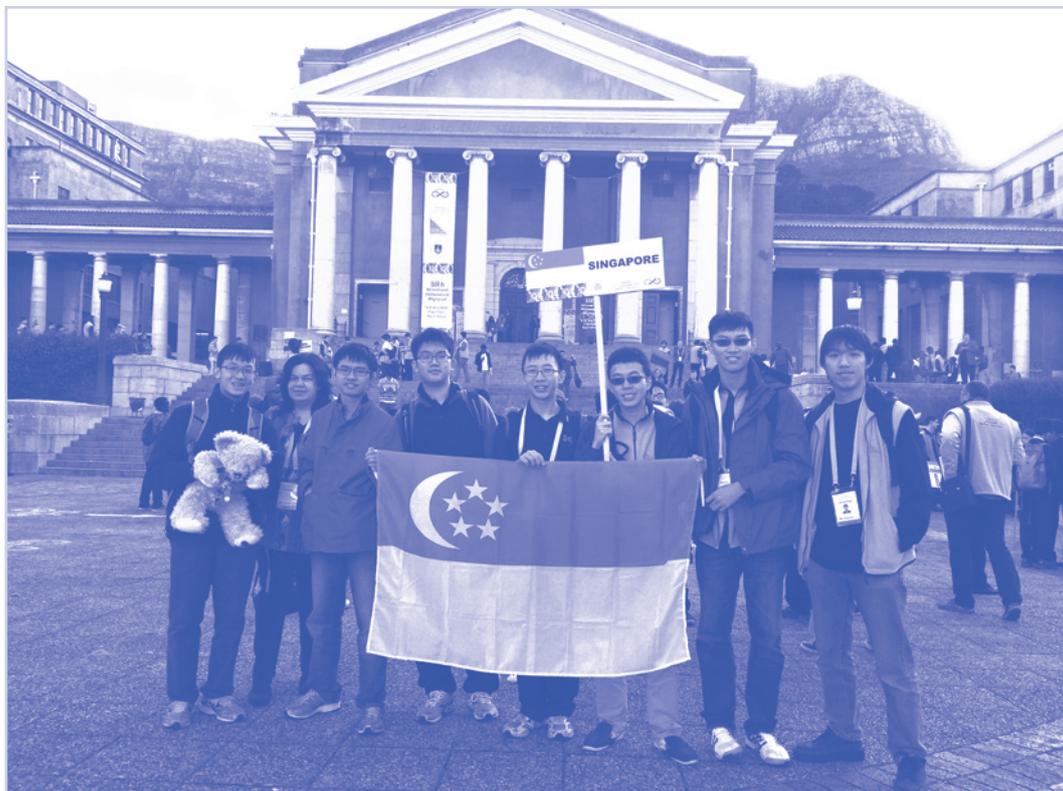
**Sheldon:** We treat one another more like team members. After all, we're all in the same competition representing Singapore together, and would certainly be delighted if all of us do well for the country. Furthermore, many of us have known one another for a long time and we've gone through many memorable experiences, which have fostered a strong sense of camaraderie.

**David:** Rivals when we are solving problems, and team members otherwise.

**Siah Yong:** We treat each other more like team members, and typically if any of us is unclear about something, the rest of the team will try to solve the problem as well or offer methods to approach the question.

**Dylan:** We are team members, and more specifically, friends. Mathematics is not to compete with others, but to repeatedly challenge oneself and push oneself to the limits of cognition and reasoning. It is with the team that I learn the most, especially in discussions where many ideas are presented. And it is with the team that I share unique experiences.

**Yijia:** Team members. After training we will stay together and watch movies, chit-chat and play pool as well. We had a lot of fun together.



6

*How do you attempt to solve competition problems?*

**Sheldon:** Just stare at it and try as many methods as I can think of to get a feel of the problem.

**Siah Yong:** Typically for geometry problems, I try to draw a diagram and look for any interesting or unusual properties. For the other areas, I typically test out small cases to see if a pattern emerges, then attempt to apply that pattern to the general case.

**Dylan:** I will first seek to understand the problem, identifying the parameters and the relationships between values. I may also consider simple or degenerate versions of the problem to provide ideas and plausible approaches from observed patterns. Then, if possible, I will attempt to simplify or manipulate the problem. Usually it is one or two ideas slowly uncovered by observations and analysis of the crux of the problem that is the essence of the entire solution.

**Yijia:** I will look at small cases and from there try to see some patterns. For geometry, I draw an accurate diagram and think about what points are useful. If all fails, I use complex numbers.

7

*What do you do, and how would you feel when you are stuck with a problem for a long time?*

**Sheldon:** I sometimes like to take breaks when I get stuck on a problem or in between problems, such as by drinking water or going to the toilet. So far, I've found that this has been able to clear my mind for a while and allows me to approach the problems from a fresh perspective when I get back.

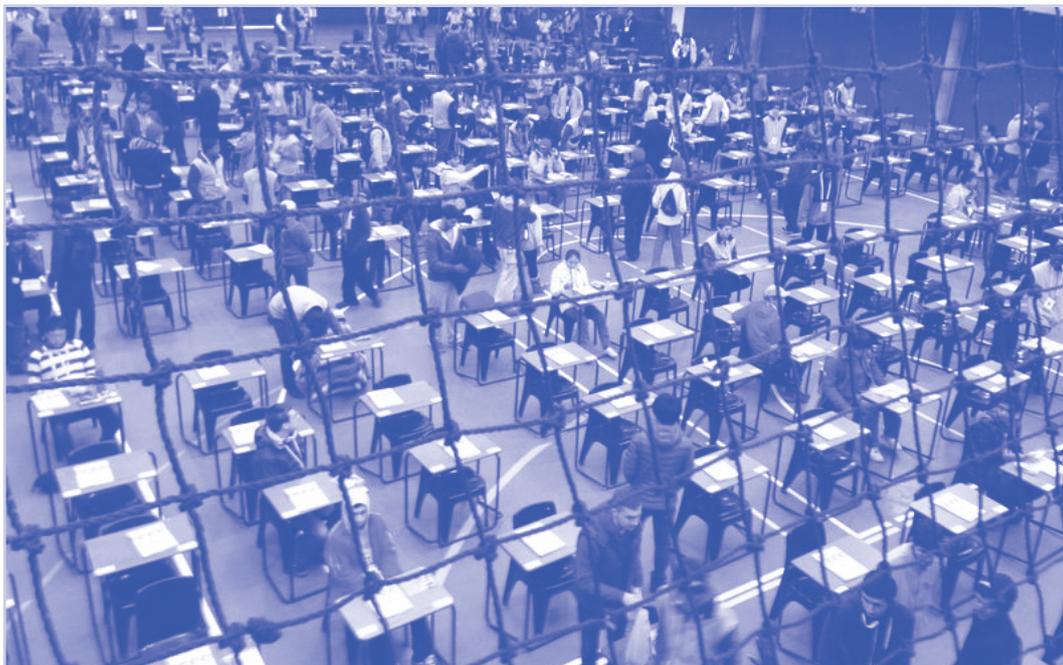
**David:** I believe that the longer one is stuck on a problem, the more you learn about the problem, because you get to see why everything you have tried so far failed.

**Yijia:** I will think of other approaches I have previously thought of and discarded initially.

**Siah Yong:** Typically I would feel tired if I get stuck on a problem for a long period of time without making headway and I would take a short break to clear my mind and reapproach the problem after some rest.

**Dylan:** I will inevitably feel unsatisfied and indignant. If I find that stress is building up, I will pen down all previous thoughts, take a break and relax before returning to it after an hour (or if too stressed, a day). Sometimes, it takes a change of perspective and a fresh start to inspire the solution that might have been by unknowingly ignored or left out previously.

**Yanhao:** Sometimes I feel sick when I work on a problem for too long. Usually I try to take breaks and come back to it later. However there are times where I don't feel like doing it anymore. In those cases I simply forget about the problem and get back to it after a year or so.



8 *What is your favourite academic field, besides mathematics?*

**Sheldon:** Probably science. I suppose this is a natural option since science and mathematics are rather closely related, and my interest in science has led me to take part in some science competitions too. Some say that mathematics is technically a science, though many of us would like to clarify that mathematics is the purest science!

**Siah Yong:** My favourite academic field would be philosophy.

**Dylan:** My favourite academic field, besides mathematics, is physics. Not only does it have a close relation to mathematics, exposure to the various fields of physics have sparked my interest in previously unexplored areas; physics has allowed me to realise that not all behaviours are directly observable but require new techniques to prove their existence.

**Yijia:** Astronomy. I find space very fascinating.

**David:** Applied mathematics.

9 *How do you feel about your experience (mathematical and non-mathematics) in the 2014 IMO?*

**Sheldon:** Both have been great. The IMO and all the trainings before that have definitely been mathematically enriching and challenging. Beyond that, all of us certainly had lots of fun at the IMO too! We spent most of our free time exploring South Africa's famous landmarks, such as going to the peak of Table Mountain and doing some hiking ourselves.

**David:** It was an interesting experience to be in South Africa, and I learnt a lot there.



**Yijia:** It was special; we got to visit many places like the Cape of Good Hope, Table Mountain and also experience a different way of life. I also got to interact with many people on AOPS (Art of Problem Solving forums) in real life.

**Siah Yong:** I felt that the experience during the 2014 IMO was invaluable, as I got to experience many things and meet people from all over the world. I also had a lot of fun there and considering everything that happened there I would find the trip to be extremely worthwhile.

**Dylan:** The experience in IMO 2014 was invaluable. Apart from the beautiful African culture and picturesque scenery, the IMO has also provided stronger friendships with the team and allowed me to learn and share memorable experiences with them.



10 *What is your future plan?*

**Sheldon:** I don't really have plans for the distant future yet, so for now I guess it'll just be studying for my Year 4 exams and Higher Chinese 'O' levels, and, of course, continue to enjoy doing math whenever I'm free.

**David:** Training hard in the coming year.

**Yijia:** It will be something related to mathematics.

**Siah Yong:** In the future, I hope to go to a liberal arts university so that I will be able to pursue my other interests in literature and art while also taking a subject somewhat related to mathematics, like computer science.

**Dylan:** I am still unsure of my ambition, but for now I can possibly envision myself as a mathematician, professor and/or physicist. I think I would need greater exposure before I decide on my career path.

*(The editor thanks Mr Lu Shang-Yi for providing the photos and editing this article.)*