

Introduction

It has been suggested that James Cranch's leader's diary might not fully reflect the experiences of the students at the 5th Romanian Master of Mathematics competition. As a result, I have written this parallel report, which takes the same diary format

The team, together with scores, is given in this table:

Name	Q1	Q2	Q3	Q4	Q5	Q6	Total	Award
Andrew Carlotti	7	0	0	6	7	0	20	Bronze
Sam Cappleman-Lynes	7	0	0	0	0	1	8	Honourable Mention
James Aaronson	7	0	6	7	7	0	27	Silver
Sahl Khan	0	1	0	7	0	0	8	Honourable Mention
Josh Lam	0	0	0	7	1	0	8	Honourable Mention
Vishal Patil	0	0	0	5	0	0	5	

The cut-offs were 28 for gold, 22 for silver and 15 for bronze (an Honourable Mention is earned by any complete solution for a score below 15). This means that had Andrew and I were very close to the boundaries above us. The UK didn't perform quite as strongly as last year, coming 8th out of 15 teams, but this is a very hard competition, and nothing to be ashamed of. While we did not win the official contest, we were in fact top in the unofficial "most nonzero cubes" competition.

James Cranch and James Gazet were the leader and deputy, respectively, as they were last year.

Student's Diary

Wednesday, 29th February

I arrive at Luton airport, met by James (Cranch), Sam and Andrew. Vishal, Sahl, Josh and James (Gazet) follow close behind. Sam has three Rubik's Cubes with him - a 3x3x3, 4x4x4 and a 5x5x5. He impresses us all by solving all three of them within a few minutes.

Then, as we pass through security, Sam's bag is stopped and searched. It turns out that the scanner did not like the Rubik's cubes. They are (eventually) allowed through, and we make it to the other side reasonably sane. The flight is uneventful, and we land in Baneasa airport in one piece.

As we arrive at our hotel, we are told that, as there are only four students to a room, two will have to split from the rest of the group, and sleep with two of the Polish team. Consensus is that those will be the younger two, Andrew and Sahl, who are a year below the rest of the team in age. It is for this reason that Sam and Josh are the ones to sleep in the joint UK-Poland room.

Vishal reveals that he has brought with him a Tim Vine pun book. This will turn out to be an endless source of mirth throughout the camp. This is followed by two rounds of ten-pun bowling (yes, this is the general level of quality of jokes that we had to put up with).

We also sample some Romanian cuisine. This includes, but is not limited to, Polenta, which is classified on its Wikipedia page as 'Peasant Food'. My various dietary restrictions prevent me from sampling the dish, but I manage to survive on the other items on the menu.

Thursday, 1st March

After a 7:30 (read: 5:30) wake-up, we are given a lecture given by the celebrated IMO superstar Ciprian Manolescu. The lecture is excellent, and this is not reflected by the fact that several UK team members nod off for part of it, as a symptom of sleep deprivation. We learn a lot about knot theory, as well as higher mathematics in general.

After lunch, we visit the Grigore Antipa National Museum. Some buildings have dogs, or even humans, to guard them; Grigore Antipa uses the rather more unorthodox method of a giraffe. It is good that there is an exhibit outside the museum, for we are forced to wait outside while our tickets are organised. The building is filled with surprisingly lifelike dioramas of various animals, first from Romania and then more exotic habitats.

This leads onto the opening ceremony. This involves a few people making speeches, most of which were difficult to hear due to the loudspeaker arrangement within the room. We also receive our RMM backpacks, complete with pens, paper and t-shirt, and ID badges. I notice that my badge reads UNK3 rather than UNK1; in fact, Andrew and I seem to have been swapped within the team. With a surname beginning Aa, I expect to be given priority in alphabetical affairs. To be placed third is quite a new experience.

Unlike in recent years, in which this competition was called the Romanian Master in Mathematics and Sciences, this year is only the RMM. There are a few physicists around, but nothing like the spectrum which included chemists and computer programmers last year. The organisers' decision to continue with mathematics is admirable, though I am biased.

Friday, 2nd March

Today is day one of the competition, whose two papers are sat on consecutive days, and last 4½ hours each. The RMM is designed to be significantly harder than the IMO, and question 1 at the RMM is comparable to an IMO question 2, in terms of difficulty. The walk from the hotel to Tudor Vianu high school lasts about half an hour. This gives us time to clear our heads, ready for the upcoming exam.

The six of us split up into four different rooms, one or two to each room. I am sitting at the same desk as a Pole. This illustrates the relaxed nature of the RMM compared to other, similar contests; at the IMO, for example, two sitting at the same desk would be unheard of.

The problems, as always, are difficult. The first problem is a graph theory problem, relating to special groups of people with the same gender. Having seen the infamous grasshopper problem from the 2009 IMO, I attempt induction on every combinatorics problem I come across. Thankfully, it works in this instance. There are two other problems, a tricky geometry and a fiendish function. I spend a lot of time on the function, handing in what I think is a mostly correct solution, but with a page of garbage at the end. However, I leave the geometry, due to time constraints.

After the exam, we learn that the UK submitted both problems 2 and 3, the proposers being Ben Elliott and David Monk. In proposing a problem the next year after sitting the competition, Ben has followed in the footsteps of Luke Betts, who managed the same last year. Who knows - perhaps one of us will be able to maintain this pattern next year?

Outside geometry problems, the intersections are slightly different in Romania to those in the UK: when traversing the road, we found ourselves under threat from a massive wall of cars bearing down on the junction when we were in the middle of the crossing. The team member who seemed most happy about this was Andrew, who later told us about a similar experience two years prior, which had now been verified as being caused by the shorter crossing times rather than the fault of the UK team.

The rest of the day proved uneventful, except for Vishal solving problem 2 based on inspiration from a Trig Drill formula. Perhaps committing all 118 formulae (at the last count) to memory might not be such a bad idea.

Saturday, 3rd March

Normally, an RMM competition would last five days: arrival, opening ceremony, day one and two of the contest and closing ceremony being the main events on those five days. This year, an organisational peculiarity means that we are one day short. The most acceptable solution involves cramming the contest day two, both days' marking and the closing ceremony all into the same few hours.

Nevertheless, we still manage to have our second exam in the morning. Today, we are faced with a number theory problem as question 4. This concerns some very large numbers, some of which have particular factors. This problem has a multitude of solution methods and the UK team will do particularly well here. I find a strange class of solutions, and Sahl finds a different (slightly less strange) class, whereas most solutions use a simple induction trick. Unfortunately, finding a base case for this proves to be difficult, and not having done so will cost Vishal his Honourable Mention.

Problem six is another geometry. I choose to implement the ingenious strategy of not attempting it; with the time saved, I manage to solve the chessboard-related problem 5 instead.

The next stage of the contest involves marking the last three questions' scripts, but as we cannot participate in this, we are taken to the Romanian presidential palace. This is a building which has been inhabited by much of the Romanian royalty, including Romania's first king, King Carl. This prompts terrifying images of Andrew Carlotti ruling over Romania with an iron fist, but fortunately, we see a portrait of the king, who looks nothing like Andrew, putting our minds at ease.

Once we have finished the tour, we return to Tudor Vianu school for the closing ceremony. It is scheduled to start at 7:30 pm, which is why we arrive there at five. In fact, the Ukrainians and Chinese scripts take longer than planned, and so we need to wait an extra hour until the show. Meanwhile, we are approached by a woman seeking Asians for what we believe is an interview, and Josh and Vishal match her criteria, so she leads them across the building. It turns out that they were actually selected to be the stars of a hit Romanian comedy sketch show. Unfortunately, they don't have the details of the name of the show and so will not be able to see the sketch as it is broadcast. Perhaps this was a deliberate effort on their part to save embarrassment.

The closing ceremony consists of more speeches, and presentation of medals. The overall winner of the competition is a Romanian, Omer Cerrahoglu. In fact, the Romanians were the winners of the team contest, tied with China. It is gratifying to note that a different country has won the RMM each year, despite the IMO winning team statistics being dominated by China.

This is followed by a banquet, and then we return to our room. The UKMT often includes torches on its packing lists, and this competition is no exception. Nevertheless, most people ignore their presence there, since they are rarely necessary. Fortunately, Andrew and I have indeed brought a torch, and so when the light blows out in our room, we are prepared. After managing to convey our problem to the lady in reception (who unfortunately doesn't speak English, which doesn't help to expedite the process), the problem is fixed.

Sunday, 4th March

Those of us who've slept wake up at 4:30 for our early flight. After vacating our rooms, we share a bus to Baneasa airport with the Americans, though they are continuing on to Otopeni. Otopeni is an altogether nicer airport than Baneasa, whose security queue, better described as a mob, took an hour to navigate through. Nevertheless, we emerge safely, leave Sam behind as he is continuing on to Disneyland and the RMM is over for another year.

Closing Remarks

Thanks are due to a number of people. These include:

- James and James (Cranch and Gazet), for leading the team;
- Bev Detoef at the UKMT office, for handling the administration;
- Everyone who has helped to train the members of the UK team throughout the course of the last few years;
- The problem composers and selectors, for choosing an excellent, if very challenging, paper;
- Tudor Vianu school, for hosting the event;
- The organisers, particularly Sever Moldoveanu, for organising the event particularly well, especially given the limited time available;
- Our official guides Silvia, Andrei, Avram and Sensy, as well as Andrei and Ioana who looked after the team as well;
- And, most importantly, Sam, Andrew, Sahl, Josh and Vishal, for being excellent company throughout the week.