GMATIC 2017 REFLECTIONS

CARL JOSHUA QUINES

October 18, 2017

Figure 1: Back, from left: DC, Ryan, Allen, Jireh, me. Front: Carabbay.

Wait, a new school year has started *already*?

1 OVERVIEW

GMATIC stands for the Grace Mathineers Interschool Competition. This year is its 27th, which was forced upon our throats using the 3^3 branding. As I noted last year in the previous reflection (at `http://cjquines.com/files/gmatic2016.pdf`), this makes it nearly as old as PMO. Dr. Tan did not say that in his speech this year.

Actually it wasn't, the 3^3 thing was only mentioned once. But it wasn't funny. Or amusing. I mean seriously.

Any school can send up to two teams of three participants, each with an optional alternate. The format is an elimination round followed by

the final round. The elimination round is written: twenty multiple choice questions followed by four questions requiring short solutions, for seventy-five minutes. The scores of each member in each team are added; the twelve teams with the highest scores qualify for the final round.

This year's final round was themed on Uno cards; it is a team oral round. Easy was nine 200-point 20-second questions, average was seven 300-point 40-second questions, difficult was five 500-point 60-second questions. Then there was a Draw Four round, officially described as "four questions worth 150 points each with variable time limits". Also, blue and maroon colors, mechanics to be explained later.

2 PRE-COMPETITION

GMATIC is like the kick-off for this year's math competition season. Early September, I messaged Shaq (Que), one of the people who manage GMATIC, if he heard anything about the contest this year.

"Sadly not. It's being disbanded now", he replied.

"Just kidding, invitations will be out by next week."

I asked him when it would be scheduled. It would be on October 18, the day before our exams. Shaq says he asked our school when exams were so they could set it a date earlier. It certainly *was* earlier.

This was concurrent with PRIME this year. I included GMATIC in the PRIME schedule so as not to hit a session. The program was basically our only preparation for the contest.

We drafted teams and filled up forms. GMATIC does not have a registration fee, which is very nice.

Then real life happened. Our exams were moved to be on October 18 and 19. I ask the members if they still wanted to join GMATIC. This meant DC and Carabbay would miss two days of exams: they had awarding for the Australian Mathematics Competitions on October 19. Still, yes, they said. It's as if they *wanted* to miss exams.

Missing exams might be rational: taking exams late means more time to revise.

Then real life happened again. A transport strike got classes canceled on October 16 and 17. On October 17 I ask Shaq if GMATIC will continue, considering the double suspension and everything. Pushing through, he said. Registration would be 8 AM.

And then the exams got moved to October 18 and 19, which meant we didn't have to skip exams! Well, except for DC and Carabbay.

3 PRE-PROGRAM

Ms. Imperial messaged me on the evening before GMATIC, asking for names so she could write the excuse letter. She told me to be at school by 6:30 AM, and I relay the information to everyone else.

The next morning I arrive at 7:05 AM. Cue everyone else staring at me as I walk through the front gate. Cue me: "Wait, we have a contest today?"

Yes, CJ, you messaged all of us last night. Okay, okay, I get it, I slept in. I went upstairs and left some requirements. By the time I get back down, Ms. Imperial is there, and she says we were waiting for Kuya JR, who would drive us there.

Me again: "See, even if I was here earlier we wouldn't have left anyway."

I bust out my laptop and check my messages. Meanwhile, Allen and Carabbay are talking about League of Legends. I am shocked that they were gamers now. I thought math people weren't into that sort of thing!

Eventually Kuya JR arrives and we ride our chariot of fire towards Grace Christian College! Hear ye, our valiant forces:

Valenzuela City School of Mathematics and Science, Team 1:

- Carl Joshua Quines (me), grade 12.
- Mark Vincent Carabbay (Carabbay), grade 10.
- Vincent Dela Cruz (DC), grade 9.

Valenzuela City School of Mathematics and Science, Team 2:

- Jireh Emmanuel Gumaro (Jireh), grade 11.
- Ryan Christopher Santos (Ryan), grade 11.
- Allen Ross Mercado (Allen), grade 10.

During transit, we talk about relationships. In particular, we grill Allen on his lovelife for an hour. Which was fun, because he was definitely the reason his last girlfriend broke up with him. He's in denial, however.

Then we grill Carabbay, but he is NGSB. Then we grill Jireh, who's currently single. We count: Jireh's been in six relationships since he got into ValMaSci. Go figure.

That's No Girlfriend Since Birth for those out of the loop.

We attempt to grill DC. Key word: attempt. He is too innocent.

We arrive in Grace at 8:30 AM. It's the same place as last year, the church inside Grace Village. As we were about to drop off, Elijamin (Claveria) and Raffy (Santiago) went out of the church. I make eye contact with Elijamin and he stares back at me. I raise my eyebrows furtively. He reacts.

There were less people I recognized than last year. There's Kyle (Dulay) and Tayan (Gelera), the people from Pisay (Philippine Science High School). There were the people from St. Jude (Catholic School): Jinger (Chong), Steven (Reyes), Stefan (Ong). Also, Josiah (Balete). And very likely some other people I am forgetting to mention. Apologies in advance.

Math Olympiad Summer Camp, the selection camp for the Philippine IMO *team.*

We register. I gravitate towards Kyle instinctively. He is standing, holding a notebook he says is from a previous MOSC. As typical Kyle, he is doing something math-related while walking aimlessly.

"You are pretty. You are not pretty", he mumbles to himself while pointing to various problems.

We talk for a few minutes while I'm still wearing my backpack. We talk about who would and wouldn't be there; in particular, De La Salle won't. Meaning Luke (Bernardo) and Albert (Patupat) and Shannon (Ho) won't be there. Ateneo was here but Dion (Ong) wasn't. And other things.

Shaq approaches us. I express surprise at the fact that he has braces now. He says that he doesn't, and that I'm just imagining it. I ask if I'm hallucinating him and Kyle as well, and he says yes.

Figure 2: Ha, I'm wearing Elijamin's hat.

He then remarks on my lack of tie, and Kyle assents. I said that I didn't want to wear ties anymore. "Okay, coach", says Shaq as he leaves. I thought the being a coach just because I was wearing a tie thing was done already.

Kyle and I approach the Pisay team and sit down next to them. Then more conversation ensues. One particularly alarming piece of information is the fact that *SIR PETRI QUIT COACHING MATH AIEEEEEEE*.

This is so alarming that Shaq passed by and it was mentioned again. He had a reaction that was on the lines of *SIR PETRI QUIT COACHING MATH AIEEEEEEE*.

It was kind of a big thing because whenever you think of Pisay and you think of math, you think of sir Petri. Okay, you think of Kyle. *And then* you think of Sir Petri. Shaq was pretty shocked at this. Pisay was being joined by some other guy who previously competed in GMATIC.

I mean, sir Petri was kind of legendary. It was Elijamin who pointed out that Mathira winners were essentially sir Petri, then people who sir Petri coached, then Kyle. Sir Petri is such a big thing in the math competition world here in the Philippines that it's kind of big news he left.

Mathirang Mathibay, a math contest organized by UP (University of the Philippines)

4 PROGRAM

Shaq left again. The program started shortly after that with the national anthem. It was a weird video with a super long historical introduction and the audio was off for the first few seconds. I tried very hard not to laugh but Kyle ended up shushing me anyway. Then the prayer.

We ended up talking about college after that, particularly the SATs. Kyle is very secretive about his college choices, aside from UP and Ateneo. Elijamin says he might want to go to college in Japan because weeb. And mentions that IOI 2018 is in Japan, so he might want to qualify.

Raffy mentions that I have research, which is really good on a college app. I don't talk much about my college choices anyway, largely because it's just UP.

Which brings us to the UPCAT, the admission test for UP. It's this weekend! I haven't prepared at all because I've been so busy. My schedule is on Saturday morning, which is from 6:30 AM to 12:30 PM because UPCAT is really that long. In contrast, Kyle's schedule is the Sunday afternoon schedule, which is way better: he gets to hear the format of the exam from earlier test-takers and does not have to wake up super-early.

On the program itself. Mr. Tan, principal of Grace, does a speech and a roll call of each school. Upon mentioning Valenzuela, he asks about Gatchalian. And suddenly the whole scene felt very familiar. When Pisay was called, their coach poked everyone and told them to stand up, haha.

Probably because it happened last year too.

Oh, and the advertising for Grace. Which was every year, apparently. This year, we were shown a vlog of a bunch of their kids going to a sister school in Taiwan. The courses they offered were mentioned, as well as some other school in Texas which would be the subject of memes.

Kyle tried hard not to laugh. Key word: tried. It was too funny.

Figure 3: Looking dank and fabulous, boys.

Then the picture-taking happened! I told Kyle that I should go back to my schoolmates, and I did, but they weren't even there, except for DC. It turns out they all went to the restroom at the same time. What.

The picture-taking made it evident there were less people. Apparently there were only twenty teams or something that day.

"And twelve would make it to the finals?" I asked.

"Yep."

Last year, a pot got broken during picture-taking. Which was funny.

Compared to last year, we filled the whole staircase with contestants, but now we only used a little more than half. We make jokes about how another pot would be broken. We took wacky pictures first, which was unsuccessful largely because math people are stoic and have no sense of humor. Definitely that.

And then there was delay time. A lot of delay time. Shaq tries to fix this by going to the front and asking for math puns. He offers two lame puns. He then tries to coerce Stefan to tell a joke, but it is clear he does not want to. Shaq eventually relents.

Then Carabbay tells me one: "What do you call the mother of cosine? Theta." It's a pun on *tita*, the Filipino word for aunt.

I kept pushing him to tell the pun to everyone, but he clearly doesn't want to. *Fine. I'll do it.*

I called to Shaq and told everyone the joke. And all I got were a few stifled gags.

"At this rate, we're going to get disqualified. Let's go home", said Carabbay.

Another guy tells a pun: "There are 10 kinds of people in the world, those who use binary, those who don't, and those who use base 3." Then DC pushes me to make another pun.

And I do. "What do you call a snake that's 3.14 meters long? A pi-thon."

And no one laughs.

"Come on guys, let's pack our bags."

Eventually very important people arrive and we take our picture. Oh, that was what we were waiting for. After the picture-taking, we take a few more pictures outside and look dank and fabulous while doing it.

5 ELIMINATIONS

After the picture-taking, we are lead to the testing rooms, which are smaller than last years' because less people. As team member 1, I thought I would have ended up in the same room as Kyle. He tells me he isn't team member 1 because Elijamin was. Rip.

Ryan and I go to our room and I sit near Elijamin. He tells me he's team member 1 because they sorted it alphabetically during registration, for some reason or another. That was kind of unusual.

Figure 4: Sleepy Elijamin.

The eliminations does deserve some remarks. I managed to remember some problems and with some help from others, I managed to compile all the questions in a separate document. Refer to that.

The elimination round was twenty four-choice MCQs, with choice E being NOTA. It also had four open-ended questions requiring solutions. Personally, I think that the written round had several problems (in addition to its math problems):

- negative angles in I.2 "is this triangle even possible?"
- arithmetic and forced 69s in I.8 which wasn't even a good problem
- a cubic discriminant but not really in I.9, which was obviously out of order in difficulty and I did not attempt solving,
- a stolen problem! I.10 was pointed out to me by Luke in MOSC 2016. I can't remember the reference, but I did remember the answer was greater than 16 and less than 48, so I guessed. The choices were 16, 34, 35, 48. Again, I remember it being kind of hard, and thus out of order in difficulty as well, so I did not bother trying it.
- I.16, the only part I problem I did not get that wasn't obviously out of order in difficulty (it was just factoring and canceling rip stupid)
- kind of ambiguous wording in II.2. In the original question, it was not made clear how many times coins were flipped, with some people thinking it would be flipped forever.
- a missing phrase in II.3, which Shaq went in the middle of the testing and corrected
- a geometry problem, II.3, that I nearly solved *AIEEEEEEEEE*. I was like, 'oh look Simson's! Wait that doesn't work...' then I was 'oh look a rectangle!' and fake-solved it using the rectangle. More on this later.

It kinda gets really really really cold halfway during the round and I wore my jacket and couldn't concentrate much because I was shivering. Bad air conditioning. I ended without having solved all the questions; the eliminations were indeed harder this year.

The round ends and we pass our scrap paper, solutions, questionnaires. While doing this, Elijamin asks me about II.2. He interpreted it as flipping the coin until it turned up heads or tails, which was probability one.

Why did I not notice her sitting behind me? She's a ninja.

Jinger then surprised me by being seated behind me as well. She also talks about II.2, saying it was kind of ambiguous. Then Shaq comes in all of a sudden, and Jinger talks about the ambiguity. Shaq did not think it was ambiguous.

6 BREAK

During break it was talking to Kyle and the rest of the Pisay people about the problems. The ambiguity was pointed out, so were the things I

mentioned above. In particular was the stolen $P(P(x))$ problem, which was given out during an MTG quiz, Raffy says.

He looks up the reference. It was indeed stolen: SUMO 2014 Algebra. Raffy hands Kyle his cellphone and Kyle looks at the problems. He notices that the cubic discriminant problem, the first problem in the test were stolen as well, with the 69 arithmetic problem being based on one of the problems there.

Shaq passes by and asks how the exam was and Kyle points out the stolen problems. He was apparently unaware of this, and was very shocked. We then eat lunch.

Figure 5: Allen and Carabbay are gaming again.

I eat lunch with schoolmates and talk about problems. Unlike last year, Ms. Imperial bought lunch early, because she's cool like that. Again they want to force me out for the horrible puns I made earlier. Again the ambiguity was a subject of question.

I then walk back to Kyle and pretend to be surprised he was eating lunch. We talk about MOSC again and how we would eat lunch together, back then. I miss those days a lot – it was a very sad-ish conversation.

We talk about college and school. He mentions his research. Apparently they have to fill out forms and time logs and everything for *every single thing* they did for their project. It was too much work, and Kyle would just not document stuff and then write up documentation to make it look like he did things quickly later on.

I type up the questions from the eliminations earlier. The Pisay coach, seeing me do some LaTeX like a boss, asks me about automatically vertically spacing, and I admit that I only knew how to do it with `\vspaces`.

Then I show Kyle the PRIME finals I wrote and he tries out some of the problems. He expresses that one question had some weird, unnatural

wording. Then Shaq passes by and mentions that I fake-solved the geometry problem earlier *AIEEEEEEEEE*.

Some time during the break Shaq approaches me and asks me where Allen was. I point to him. It is later revealed that Allen did not pass his solutions to part II, which was half the points. Rip.

7 PRE-FINALS

The program resumes. We are still berating Allen for not passing his solutions to the open-ended part. I mean seriously, how can you forget something like that?

It was unsurprising, then, when the final teams were called and their team was not a part. We were Maroon 6. Sadly, we were not the fifth team, which would allow us to call ourselves Maroon 5. Other teams included the usual: Pisay, Ateneo, St. Stephen's, St. Jude's.

We were seated, given dry-erase boards and markers, and our cards. And then Shaq explained the mechanics for the final round, which I will do now.

As previously mentioned, there were four rounds. Easy was nine 200-point 20-second questions, average was seven 300-point 40-second questions, difficult was five 500-point 60-second questions. Then there was a Draw Four round, officially described as "four questions worth 150 points each with variable time limits".

There are twelve teams, divided into six Maroon teams and six Blue teams. The questions are also assigned colors: there are an equal number of Maroon and Blue questions, with some questions being both colors.

Figure 6: The team behind us was wearing suits. That was intimidating.

Then, each team has Skip and Reverse cards. Any team can use the Skip card to remove their color on a question, and the Reverse card to remove the opposite color on a question. A color can only use their Skip and Reverse cards once per round. If using either card would have no effect they are not considered used.

After the effects of Skip and Reverse, if the question is of a team's color, they get $1.2\times$ as many points if they are correct and a $-0.5\times$ penalty if they are wrong or have no answer. Otherwise, points are scored normally. This implies that Skip and Reverse cards affect every team of that color.

Each team also has a Wild card, which can be activated once per round, giving $2.5\times$ points if correct and a $-2.5\times$ penalty if wrong. The Wild card nullifies the effects of color.

The Draw Four round is special and its questions are uncolored, with Wild cards not allowed to be used.

The rules were much more sensible and balanced this year, compared to last year when a team used their power-up and shot from sixth to second place. The solution, of course, was to make each team equal. The mechanics were certainly complex, but not as much as last year's.

The strategy was obvious. Avoid using Wild cards in questions of your color. Use Skip cards on hard questions of your color. Use Reverse cards on easy questions not of your color.

The key for the Skip card was to do it *as early as possible* – if it was a question of your color that only your team would get, you *do not* want to use the Skip card. The easiest way to ensure this was to use up the Skip card early.

After a few questions, the round began.

8 FINALS

. . . well, it didn't *quite* begin. I raised my hands quickly and asked to go to the restroom because I really needed to release. They said yes, and a few other people did, and *then* the round started.

Some overall remarks. Everyone calls the Maroon teams Red instead of Maroon, even Shaq, who quickly corrected himself. I mean seriously, why not use Red instead? Some more color confusion was on the bicolored questions: the rules called it "bicolored", the quizmasters called it "yellow", while sometimes they called it "orange". But really, red and blue make purple. Or magenta.

But that wasn't the worst part. It was the color discrepancy between the spreadsheet the scores were entered in and the slides. *They were of opposite color*. The slides showed blue backgrounds for questions that, according to

the spreadsheet, were maroon. Worse, the quizmasters followed the colors of the spreadsheet, which lead to some confusion.

And now we go to the questions themselves, and some narration. Questions are available in a separate document.

- We messed up E1. Yes, it was an arithmetic question and yes, *we messed up in arithmetic*.
- We were not going to use Wild on E2 because the slides were red. However, Carabbay told me that the question was actually Blue, so we raised our Wild card just in time.
- Only one team (MGC I think?) got the E3 question and we got it like, one second after the timer.
- We were going to submit 16 for E4 when DC and Carabbay quickly stopped me because I *messed up in arithmetic*. Thankfully we changed the answer in time.
- On E7. The official answer was 27, but the judges said the answer should be 67 so they accepted 67.
- E9 was cute – the bounds on an angle was $[0, 2)$ instead of $[0, 2\pi)$. So when we were looking for $\cos G = \frac{1}{2}$, I was like, okay, $\frac{\pi}{3}$ is in the range. Then DC asked, wait, was $\frac{5\pi}{3}$ in the range?

  And I answered, no, using $\pi = 3$ made it 5, larger than 2. Like a physicist.

  So our answer ended up having a lot of whitespace on the right side of the board, as if we were going to write something more. Anyway, the official answer included $\frac{5\pi}{3}$, indicating that 2 was a typo. I was tossing looks over at Pisay's end, which only answered $\frac{\pi}{3}$ like we did.

  Someone needed to complain. I nodded at Elijamin. We stood up simultaneously, walked to the judges simultaneously, and said, as if we knew what the other would say, "$\frac{5\pi}{3}$ is not less than 2."

  We turned back and sat down at the same time as well. That was cool. The answer did get corrected in the end.
- Back to E7, they realized that 27 was in fact correct, and replaced it with a different question. The replaced question was so confusing and it did not make sense and no one got it.
- We raised wild on A1 in the first few seconds. Then I wrote $\frac{1}{5}$. Then Carabbay was like, wait, shouldn't it be $\frac{2}{5}$? And DC was like, yes, it should be $\frac{2}{5}$. So I instinctively changed it to $\frac{2}{5}$. Close call.

- A3 was frustrating – I figured out the solution really quickly but made a mistake in solving for the altitude to the hypotenuse. DC and Carabbay were checking my work when time was called.

  I got $5\sqrt{2}$. Then one second after time was called, DC said it should be $2\sqrt{5}$. Transposition error, ugh.

- A5 was also frustrating. First, Carabbay asked if 101 was a prime, it was. I was going to compute 101^5 using the binomial theorem, but DC added all the factors manually first, so we wrote his sum quickly.

  As I was checking his addition, I noticed something was off. There were the wrong number of digits. Then time was called, and I realized – DC missed writing a zero. Our answer was 10510105. The correct answer was 105101005.

- We had no idea how to solve A6 without bashing, so we did bash. There was not enough time, however, so I just wrote in 15 without thinking, because it was a factor and I knew the answer had to be integral.

  Then I did the math in my head and realized 15 was too small. The correct answer was 50. Whoops, 15 and 50 were homophones.

- So we did PIE really really quickly for A7 after instinctively splitting up the work. We got 434 after triple-checking all the sums.

  Then I realized... what about the intersection of all the divisors? There was 1! You had to add 1! Then time was called. And we were supposed to be the only team who would have gotten the correct answer. But no! We made an off-by-one error.

- When D1 was given, the problem immediately felt familiar. I had seen this before, in a different contest. I remember the answer being near 130 or 140.

  A quick estimate shows that the answer's at least 100 and at most 200. I suggested modulo, so DC did mod 10 and got the last digit to be 4. So I wrote 134 tentatively. But it felt too small, we needed some confirmation for the middle digit.

  Then I did mod 9 and my brain farted, so DC picked up the mod 9 again and got the middle digit to be 4. I confirmed his mod 9 calculations, which were nice because $133 \equiv -2$ and $110 \equiv 2$, so they canceled, and $84 \equiv 3$ and $27 \equiv 0$ so their powers were both zero.

  And then we were the only team that got the correct answer! I shouted for joy because I was really happy, and everyone was looking at me because I shouted too loudly and Carabbay began shushing me.

- DC told us he was familiar with D2, like I was familiar with D1. So we started bashing from 7. And we initially thought 51 was a prime, and thought 47 was the answer, brain fart. We then got 53, which kind of fit a "middle-aged man".

  Then DC remembered the reference: it appeared on Numberphile, he says, and he remembered the answer to be in the 50s. DC exclaims he would start remembering the answers to these problems, after D1 being in literature as well.

- D4 was funny. I had no idea at the time, so I drew a diagram and made some estimations after using the obvious Fact Five. I wrote 21.

  Then Carabbay pointed out that 7-24-25 was a Pythagorean triple, so 24 would be more plausible. I briefly considered changing it, but DC justified that the answer being 24 would make it too easy. We kept 21.

  The answer was 20.

- D5 was frustrating. After quickly guessing that all even numbers would work, DC thought that only even numbers would work, so we wrote that. We only got even numbers anyway. Then I started thinking.

  Time was called and boards were raised, and then I noticed the team behind us had a huge list of numbers and 7 was one of them. Wait, was 7 possible? I plugged in some numbers and wait, right, 7 was possible. Whoops.

- Surprising fact: we were second-to-last after easy, sixth after average, and then third after difficult. This made us really really really happy, because if it's maintained, we would win!

- After D5, A2 was rescinded. The official answer was 11, the number of floors ascended. The judges, however, said the answer should be 12, the floor the person ended in. This was a fencepost argument.

  Elijamin quickly argued with the judges. Josiah seemed like he wanted to complain as well, but nothing. The slide was returned to the question in order to reveal its ambiguous wording, which Elijamin latched on.

  After a minute or so, I rose up and explained my case, explaining the error and how the question did not specify, making 11 and 12 equally reasonable answers. I then sat back down, and then the judges were like, "um, we'll consider this for now so just proceed with the Draw Four round."

But the Draw Four round was whack. They started to bring out Rubik's cubes. It quickly became evident that the Draw Four round wasn't math questions. Yep – the Draw Four round was a bunch of puzzles.

The quizmasters announced that there weren't enough cubes for everyone, so the Blue teams were to go first. Us Maroon teams were shuttled to a holding area.

Figure 7: Getting shuttled off to the holding area.

Of course, there was rife speculation with what was going to happen next. We ruled out the possibility of them asking us to solve the cubes, as that would be too common. Instead, we guessed it would be reversed – with the cube starting from a solved position, to bring it to a specific pattern.

There was speculation on the other tasks, given that some people saw a Rubik's Snake. Some suggested it was going to be dancing, or math puns. Shaq's attempt to get us to say math puns earlier was only preparation!

Meanwhile, Josiah and DC made a parody on the song Baby Shark. It went like this: "One plus one, two-two, two two two-two, one plus one, two-two, two two two-two, one plus one, two-two, two two two-two, one plus one!"

If you live under a rock and are unfamiliar, it's on `https://youtu.be/XqZsoesa55w`.

Yes, the names of the sharks were replaced with expressions that were equal to two. Stuff like, "First even prime, two-two, two two two-two" or "Number of real solutions to $x^2 - 3x + 2 = 0$, two-two, two two two-two". Normies. Please.

"The unique positive integral value of k such that $\zeta(k) = \frac{\pi^2}{6}$!"

I got a few stares. I drew in a breath,

"Two-two, two two two-two. . . "

We were called outside, and yes, it was starting from a solved cube and forming a pattern. It was a blue F pentomino with some red and white in the corners. We briefly formed the pattern and I remarked how putting pentominoes together might be a puzzle, like tangrams were.

After this, Carabbay started playing with the cube and forming patterns. We shuffled and solved it. I have gotten too slow. I used to be sub-40. All the teams managed to solve the puzzle. Interestingly, all of us in the team knew how to solve a Rubik's cube.

Then they started handing out the Rubik's Snakes, which started in the shape of a cross. Carabbay and I quickly guessed they were going to be formed into a ball. Which again, all of us in the team knew how to. So I did it. The challenge was that the pieces were curved instead of straight, and were all of the same color, which made it harder.

Anyway, the time was called and we were the only team holding a ball. Then we were asked to raise our puzzles, and then all of a sudden Maroon 2 was holding a ball too. Other people were holding. . . snakes.

We were shuttled in the holding room again, and I take pictures of people, of remark being Tayan.

Figure 8: Tayan looking dope.

I sat next to Tayan and his team, and we talked about school. Tayan talks about his research and asks me about mine. He remembered my project from a year ago, the one involving brine shrimp, and it was nice that he remembered.

His teammate, I think he was Arthur (De Belen), noticed that I was wearing an ISEF lanyard and asked if that was the project that got into ISEF. I laughed and said no. I didn't expect anyone to notice the lanyard.

When we got back, we did two more puzzles. One was arranging colored circles in a 3×3 square according to certain rules, and we did it relatively quickly after working it out on paper independently. Then we noticed the solution was on the box.

The other puzzle was... arranging polyominoes to fit in a triangular grid. Which was totally what I called earlier. And we spent a lot of time trying it without being able to do it. After time was called, the proctors pointed out that the solution was on the box, but the one on our box was partially blacked out.

Figure 9: The polyomino puzzle we didn't get.

DC was so frustrated by the puzzle that he took a picture of it and resolved to finish it. That being the end of the competition, Kyle walked past our team and we talked about stuff. I asked him to show the solution to the polyomino puzzle, since their team got it, but he couldn't remember.

At this point, the judges ask all of us to take our seats again to resolve the A2 thing earlier. They decided to replace it with a different question: in a regular octagon, what is the product of the distances from one point to each of the other seven?

It felt oddly familiar, and I recall the answer being an integer. DC managed to multiply the first five lengths but couldn't figure out the other two, and then time was running out so I made a guess of 8. We were right. Hooray for guessing.

9 AWARDING

We were third in the team round.

We were third in the team round. Goodness, that hasn't happened before.

Winners in the team round were awarded first, we got third, Kyle's team got second, Tayan's team got first. Hooray for Pisay, right? Then individual winners were awarded, Kyle was third, and someone else, then Stefan got first. Me and my memory.

We took some obligatory pictures. Souvenirs were given out, as last year: the group picture, mugs, the obligatory Grace envelope. I was talking to Kyle and Shaq about some stuff – comments on the competition, college, stuff like that. It was fun talking to them. It reminded me of MOSC.

Jireh, Ryan, and Allen ask us why we failed the first question, when they got it mentally. We share a laugh about how the results, and berate Allen again for not passing solutions to part II. We take a picture in the stage and Jireh's team held the trophy, talking about *their* achievement and how *they* won.

Shaq points me to one of the Mathineers who wanted to me "to include her in [my] vlog." I ask if she wants to take a selfie with me, and she says yes. I ask her for her name and she doesn't want to tell. Oh well.

Figure 10: She totally wanted to take a selfie with me.

As we leave, I'm still talking to Kyle about college and math comps. I tell him I'll have my revenge. He asks would the next competition we'd all meet each other be, and I say it would be PMO quals, followed by Sipnayan. We walk away and Kyle says he will have his revenge, too.

Going home, DC was cutting out graph paper and solving the polyomino puzzle from earlier. Jireh's team seems to like pretending as if they won the contest, and they had plans about how they'd post it on social media and everything. We decided not to post on Facebook and surprise Ms. Soriano about the results.

We arrived on ValMaSci and Jireh's team steps out the vehicle holding the trophy. They carry it all the way to Ms. Soriano's table, who was out. And take some pictures with it, and tweet.

10 EVENING

Figure 11: Yep, they *totally* won that. Definitely them.

True enough, Jireh's team posted in social media pictures of them and the trophy with captions like "Wow, this was totally unexpected". It was amusing to see everyone congratulate them. Ms. Imperial posted on Facebook despite our agreements not to, only to have her reveal that Ms. Soriano forced her to tell what the results were.

Kyle messaged me afterward talking about the geometry question from the written round. It turns out I *was* right – it was indeed a rectangle and Simson's. Just put together. Upon realizing this, I facepalm. I also realized how to solve D4 from the oral round.

(Nathanael) Balete-sempai messaged me asking about the Euler conjecture problem, asking how we did it. I explained the use of modulo and estimation. I then admit I'd seen the problem before, and he says he knew that background knowledge was involved.

He also asks about the replacement distances in an octagon question, and points out the answer was just the number of vertices, asking for a proof. He says he thought of a complex bash proof. I thought of a proof using the product of sines in arithmetic sequence, the proof of which also involved complex numbers.

Dion messaged me afterward congratulating me. I ask him why he didn't come and he said he was busy, and that he had a commitment the next day.

"As long as you come to PMO quals", I say.

"I will", Dion replies.

"So you could go *NOOT NOOT* with Andres."

11 CONCLUSION

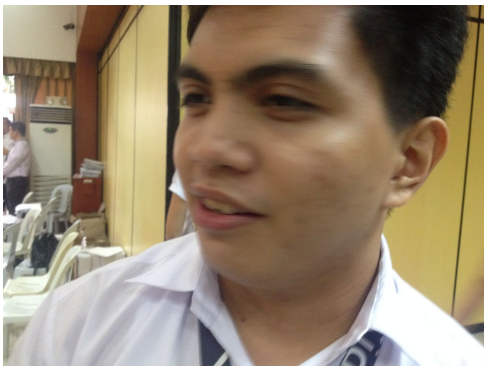

Figure 12: Bonus Kyle picture!

While we were leaving, Shaq invited me and Kyle to GSCITIC, or something, their competition for science. I say that I didn't have any friends in the science competition seen, and Kyle said same.

That was a good reminder of why I join contests in the first place. Not, primarily, to win or enjoy the problems, even though they are part. It was to be with friends, to enjoy the experience of being with people I can talk to and relate to. It was nice, that was nice, I wanted more of that.

Thanks to the Grace Mathineers for coordinating the event once again, for free, hooray. Thanks to Ms. Imperial for accompanying us and to Kuya JR for driving. Thanks to the Mathematics Department for throwing money for food and gas. And of course, to my colleagues, without which mathematics would not be worth doing.