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“WHAT’S THE MOST IMPORTANT THING YOU’VE LEARNED IN UNIVERSITY SO FAR?”

Hey, you! You've got a very special issue of **mathNEWS** in your hands (er, on your screen?) right now. Before you dive in, allow me to take you through the highlights of the feast to come:

- Our featured professor this issue is none other than the Dean of Mathematics himself, Mark Giesbrecht!
- This week's Article of the Issue is a definitive, highly-detailed tome for anyone curious about the state of student housing in Waterloo.
- **mathNEWS** is in the midst of a serial fiction boom! Don't let the “Part 1”s and “2”s and “3”s in all the titles mix you up!

Before I go, I'll leave you with the following image. There just wasn't enough space for it in the issue proper. (Where would we be without the **mastHEAD**?) The artist Cix asks us the question: *If a goose wore pants, would it wear them like this?*



clarified
Editor, **mathNEWS**

- ME** | Do ☹ Not ☹ Sign ☹ Leases ☹ At ☹ Unfinished ☹ Residences!
- BOLDBLAZER** | No one fucking cares about whatever shit happens. People just ignore it all and carry on about their own lives. Sometimes it's a good thing, sometimes not so much.
- DERIVING FOR DICK** | Pink is a really good color.
- PREDAP** | It's not worth beating yourself up if you make mistakes. Even big ones. Just do your best from that point forwards.
- ABALD MAN** | Being bald is great.
- TENDSTOFORTYTWO** | Induction.
- JEFF** | **mathNEWS** Editor is a ruthless dictator [Editor's Note: And what about it?]
- CC** | Rise up / When you're living on your knees you / Rise up / Tell your brother that he's gotta / Rise up / Tell your sister that she's gotta / Rise up / When are these colonies gonna
- APHF** | There is only one **mastHEAD** document, they just reuse it. [Editor's Note: It's called efficiency.]
- A COOL PEN NAME** | I can survive at most 2 weeks on 4 hours of sleep a night. That's an optimized rate of 1 second of sleep for every 6 seconds of existential dread.
- FUCK** | PD
- PSYCHGIRL** | Everything is temporary!
- ME 2** | never use your own happiness as the sole fuel for your academic mission
- GIRAFARIG** | How to most efficiently move across the country
- CY** | being a cyborg is suffering
- FINCHEY** | The layout of the secret catacombs underneath campus which extend across the Waterloo Region from Wellesley to Ayr.
- CLARIFIED** | How to use the Linux terminal.
- GOD ♚ PEED** | You're not going to that early class no matter what you tell yourself.
- BIPED** | That, in your social life, you can just go do whatever you want. Nobody is stopping you from anything.

ARTICLE OF THE ISSUE

The Article of the Issue goes to me's [A Place to Live Part 2!](#) 🦄🦄🦄

clarified
Editor, **mathNEWS**

The answer to the pants question is yes, by the way.

CLARA XI, **mathNEWS** EDITOR FOR SPRING 2021
ALONG WITH TERRY CHEN, KEVIN TRIEU, AND YANG ZHONG

mathASKS 146.3

FEATURING PROFESSOR (AND DEAN OF MATHEMATICS) MARK GIESBRECHT

QUANTUM GOOSE: WHAT'S IT LIKE BEING DEAN?

I wish I could say it's all cool, talking to our brilliant students and professors, making the world a better place, like some Marvel action figure, but with math and computers. But in reality, there's an awful lot of careful governance, consultations, making sure everyone is properly engaged in every decision. I really believe in all that, but it gets in the way of my superhero aspirations. Probably a good thing.

CC: WHAT IMPROVEMENTS ARE YOU PLANNING TO BRING ABOUT AS NEW MATH DEAN?

To get us through COVID and actually gain something positive from it? That sounds very "operational" but there is some truth in it. COVID has been very hard on everyone, especially students and instructors. But we have learned a lot about how we teach and how we learn and I really want to take this forward in a positive way. Beyond that, I really believe that Waterloo is a unique place, not just because it is the world's only Math faculty, but because we connect math, statistics, and CS to the "real world," through our academic programs, through co-op, through research, and through our entrepreneurial spirit. I want to make sure that everyone is a part of that, and that everyone sees it. And I want to ensure that as students, professors, and researchers we are all able to participate in, and contribute to, the full spectrum of opportunities.

BOLDBLAZER: WHAT DOES A DEAN EVEN DO?

Meetings, lots of meetings. All on Zoom/Teams/WebEx/... To stay abreast of the current business of the faculty, I constantly meet faculty, staff, and students, as well as the University leadership. And then try to distill all that, mix appropriately, garnish, and redistribute. Sounds like I'm a bartender, or at least an academic mixologist. A good part of my job is promotion of Faculty activities and successes, and leading the way for the path we want to take next. Right now, a lot of it is around getting beyond COVID, but as I said earlier, I'm trying to focus on coming out with something very positive, as well as making sure we're serving all our current students.

QUANTUM GOOSE: DID YOU EVER FIND THE 17 OTHER COPIES OF mathNEWS PURPORTEDLY HIDDEN AROUND YOUR OFFICE, CAR, HOUSE, AND JACKET, AS REPORTED IN PAGE 14 OF mathNEWS 143.5 (<https://mathnews.uwaterloo.ca/wp-content/uploads/2020/07/mathNEWS-143-5.pdf>)?

Mystery revealed! The truth is that I've barely been in my Dean's office or my research office and the squirrels have moved in (that explains a lot about the Dean's office I'm sure). I used the **mathNEWS** copies to plug the holes, and the squirrels enjoy **profQUOTES**.

TERRIFIED: HOW DO YOU BALANCE RESEARCH WITH ADMINISTRATION?

That's a tough one. Saying that I miss research would be an understatement. I've been doing serious administration since starting as Director of CS in 2014, but the Dean's job is a whole other level. I have great grad students and postdocs who keep me going, though they probably need to see me a little more. And I'm still most happy playing with new ideas and techniques. My research in computer algebra is very much at the border of mathematics and computer science, so a positive aspect is that I'm meeting more people across the faculty to ask dumb questions. A lot of good research starts with "dumb" questions with no good answers (which lead to more questions).

ME: A RITE OF PASSAGE FOR NEW MATH DEAN IS A LIVE COMMENTARY OF "INSIDE OUT", ONE OF THE BEST MOVIES OF ALL TIME. WE ARE LOOKING FORWARD TO YOUR LITERARY ANALYSIS OF THIS MASTERPIECE. WHEN ARE YOU STREAMING IT?

As soon as we are back in campus and physical distancing is no longer required. This masterpiece can only be appreciated in person. I propose a free screening in my Dean's office, which has a rather inordinately large screen. You're all invited, when capacity limits allow.

CIX: WHEN DID YOU KNOW YOU WANTED TO DO A MASTERS? A PHD?

I'm not really sure. I just kept going. Somehow after undergrad it just seemed easier to go to grad school instead of Microsoft, which was getting going in Seattle when I graduated from UBC in 1986. Maybe I'd be retired on a yacht right now. But grad school was the right direction for me, and I truly enjoyed that time of my life.

WALDO@<3.LE-GASP.CA: HOW DID YOU CELEBRATE YOUR FIRST (INTERNATIONAL) PI DAY AS MATH DEAN?

We had a fun Sunday dedicated to it. As usual, we had plenty of pie in different varieties and COVID sadly meant everything was virtual, but happily I got to eat more pie! Hopefully next year we'll be in person and I'll be off my sugar high by then.

ROYAL NO.69 MILK TEA: WHAT WAS IT LIKE TEACHING CS 135?

It was a blast, seriously. I still keep in touch with a few of the students (and hi to the rest of you – I appreciate you putting up with me as I tried to be Director of CS at the same time). I was involved in getting Racket (then Scheme) into our first year in 2004 and it was great to be a part of it again. Though I didn't get into **profQUOTES**, so clearly I was off my game.

VINCENT MACRI: FOR YEARS UNDERGRADUATE STUDENTS HAVE LAMENTED ABOUT HOW MUCH THE COURSE CONTENT AND ASSESSMENTS IN STAT 231 SUCK AND THESE ISSUES HAVE PERSISTED AFTER MULTIPLE ATTEMPTS TO IMPROVE THE COURSE. WHAT, IF ANYTHING, IS THE MATH FACULTY DOING TO TRY TO FIX THIS CORE COURSE?

The statement that the course content sucks suggests that some students do not like statistics. That is probably the case, but we believe everyone graduating from the faculty should have had an exposure to statistics. Statistics is key to so much of modern data science and computer science, and having a basic understanding of it really is an essential life skill. STAT 231 is certainly unlike any of the other Core courses, and has an emphasis on communication, which gives it a very different flavour. STAT 231 has been constantly improved term-over-term as we get students' feedback, and that feedback is helpful. This is indeed on our radar and we have been engaged in conversations with student leadership over the past year. In November 2020, a motion was passed at a MathSoc Council meeting calling for a redesign of STAT 231. MathSoc VPA Harleen Bhandal worked with our ADUG and with Associate Chair in SAS to understand if the problem was really at the design level, at the delivery level, or a covid-delivery offering issue. This led to a February 2021 meeting with MathSoc leaders Josué Kurke and Vincent Macri, MathSoc VPA Angela Wang-Lin, and Faculty members in Statistics to further explore the issue.

One item brought was the role of R in the course. The Faculty agrees that the purpose of using R was not previously being clearly communicated to students, and efforts were already being done to improve this communication, especially with the use of assignment debrief videos in the winter offerings of STAT 231. This is one example on how the feedback from students helped improve the delivery of the course.

TENDSTOFORTYTWO: WHAT'S YOUR FAVOURITE COURSE YOU HAVE TAUGHT, IN TERMS OF (A) HOW FUN THE CONTENT WAS, AND (B) HOW FUN IT WAS TO TEACH?

CS 136 the first time it was taught in Winter 2005. Prabhakar Ragde developed CS 135 that fall and the idea was to carry students from Scheme to Java at that time. I won't claim that version of CS 136 was perfect (and C is a better second course), but it really felt like we were doing something novel and exciting. And we played some great music.

TLLLOW PRINCESS: WHERE IS YOUR FAVOURITE TOILET ON CAMPUS?

The ones not in the Davis Centre.

ABALD MAN: HOW MUCH DO YOU SAVE ON SHAMPOO FROM BEING BALD?

Let's do the math. If men spend approximately \$24 a year on shampoo, then I can expect to save \$120 in the next 5 years.

NARF DERT: SINCE THE START OF THE PANDEMIC THERE HAS BEEN A SUPPOSEDLY SHARP INCREASE IN ACADEMIC INTEGRITY VIOLATIONS. WHAT DO YOU SEE THE FACULTY DOING TO COMBAT THOSE WHO CHEAT? DO YOU THINK WE WILL SEE CHEATING GO DOWN FOLLOWING A RETURN TO IN-PERSON INSTRUCTION?

First, whenever academic offences are detected, penalties are assessed in accordance with the guidelines attached to Policy 71. We try to be consistent with precedent and with practices in other Faculties. We have tried to show some understanding of the stress students have been under during the past year, but a finding of guilt always results in a penalty, and serious or repeated offences result in more significant penalties.

We know that there are probably many offences which do not get detected. However, it is possible that the percentage of offences which do get detected is higher than students realize. Because we protect privacy, students generally won't know when their classmates have been found to have offended.

There are efforts under way to put more emphasis on education. For example, a video produced by students (under Faculty supervision) will be available to MATH 135 students this Spring. The Office of Academic Integrity (<https://uwaterloo.ca/academic-integrity/>) is continuing to work on educational modules for both undergraduate and graduate students (the graduate module is a requirement for all grad students). Many courses remind students regularly of the expectations for each assessment.

Instructors have made a number of adjustments to try to make cheating less likely (by rethinking the kinds of questions we ask) or more detectable (by inserting security features into the assessments).

These measures are probably never going to match the effectiveness of in-person proctoring, so yes, we are optimistic that we will see a return to pre-pandemic incident levels in the future. We won't really know until we get there, of course!

PSYCHGIRL: IS MATH REAL OR IS IT A CONSPIRACY CREATED BY THE ENGINEERS?

Math is discovered. It's real, and perfect, waiting to be revealed. How can there be a conspiracy? Engineering, on the other hand, is invented. Need we say more?

NO GENDER, ONLY HOOTY: IS MATH IN HUMANITIES?

No, because it exists beyond humanity. See above. Perhaps inhumane?

A COOL PEN NAME: WHAT'S THE WORST FACULTY AND WHY IS IT ENG*NEERING?

While I'm obligated by my oath to the university to say that all faculties are equal, I'm also contractually obligated not to lie. That's an academic offense.

ANONYMOUS: WHAT IS THE BEST FILM OF ALL TIME, AND WHY IS IT “THE BEE MOVIE”?

According to all known laws of aviation, there is no way a bee should be able to fly. Its wings are too small to get its fat little body off the ground. The bee, of course, flies anyway because bees don't care what humans think is impossible. There's a lesson in there somewhere.

CLARIFIED: WHAT IS SOMETHING THAT YOU ARE LOOKING FORWARD TO THIS YEAR?

Sitting outside on the Bombshelter patio on a sunny day, not drinking a Timmy's. We have to make this happen!

BOLDBLAZER: WOULD YOU ALSO CONSIDER THAT A GOOD SUITABLE NAME TO GIVE TO A SCRUFFY OWL WOULD BE “FORMER UN SECRETARY GENERAL BAN KI MOON” INSTEAD OF THE MORE BORING CHOICE OF “HOOTIE”?

What is wrong with Persephone the Uncanny?

ANONYMOUS: HOW DO I BECOME MORE AERODYNAMIC?

Practice planking. Also, hair removal has more than cost benefits.

ABALD MAN: WHAT IS YOUR FAVOURITE MATH/CS PROOF?

The proof of Weil's theorem bounding character sums with polynomial arguments. Sounds arcane, but it gives amazingly nontrivial bounds on functions that don't obviously have them. It took more than a decade for me to find a good use in my research, but once you have a hammer you go looking for nails...

PSYCHGIRL: WHEN CAN WE SEE YOU SIT ON THE MATH THRONE FOR ORIENTATION? WHEN YOU DO, WILL YOU BE WEARING A PINK WIG?

I have a pink wig that I have traditionally worn as CS Director at orientation (and occasionally to CS School Council). It is old and itchy and of dubious provenance. Perhaps this is a good use for the \$120 saved on shampoo.

A MIEDIOCRE KITTY: DO YOU KNOW WHEN THE DECISION REGARDING WHETHER OR NOT FALL 2021 WILL BE ONLINE OR IN-PERSON WILL BE MADE?

Even now in June this is a moving target, but we are committed to creating a campus experience for those who can come to campus, and providing great online materials for those who cannot. Our expectation for planning is classrooms at 50% capacity, which means not all students are going to fit onto campus for a “regular” experience (see pigeonhole principle). And we may still be facing health concerns if COVID variants arrive, so we've got to be ready to pivot. That said, we are committed to putting together a great experience for students, especially as we restart the “campus experience” that all of us love, students and faculty alike.

ANONYMOUS: WHAT'S YOUR OPINION ON THE USE OF MÖBIUS?

Möbius is part of our infrastructure for many of our online courses, in the Core and in our CEMC outreach materials. The idea that we have an educational platform with an actual symbolic computation engine behind it that actually “understands” some mathematics is a real boon, and something not available in any other educational platform. This has been invaluable during the pandemic for our online deliveries. But it is software, and like all software it is buggy (undoubtedly more than it should be). It is improving, and most importantly it is a platform for the really incredible course content developed by our instructors.

N THINGS FROM AROUND CAMPUS WRITTEN IN THE mathNEWS STYLE

- mathSOC
- davisCENTRE
- timHORTONS
- ionSTATION
- villageONE
- danaPORTER
- ringROAD
- rockGARDEN
- minotaHAGEY
- coffeeDONUT
- biologyONE
- chemistryTWO
- engineeringFIVE
- columbiaICEFIELD
- environmentTHREE
- graduateHOUSE
- healthSERVICES
- modernLANGUAGES
- bowsersCAFE
- warriorFIELD

tendstofortytwo

Solely to provoke an argument, I will say that I don't believe in infinite sets — they are merely convenient fictions.

PROF. DAVID WAGNER

PMC PROBLEM 4: DIY CONJECTURE

I've got a special one for y'all this week!

Like most aspiring amateur mathematicians, I have many a time attempted and monumentally failed to prove the Collatz Conjecture. Regardless, it is still the most fun piece of mathematics I've ever encountered. So let's play around with it this issue. See the appendix for details about this Conjecture.

APPENDIX (IT'S IMPORTANT)

Take $m \in \mathbb{N} \setminus \{0\}$. If it's even, divide m by two. If it's odd, multiply m by three and add one. Iterate this process. Collatz Conjecture: this process reaches 1 after a finite number of iterations (and then cycles through 1, 4, 2, 1, 4, 2, 1, ...) for any starting number m .

Unless you're Terry Tao (if you are then holy shit!! H!!!), it's best not to spend too much time proving that one. But I can represent this "rule" with the following notation:

$2n \rightarrow n$ (divide by 2)

$2n + 1 \rightarrow 6n + 4$ (times 3 and add 1)

So, on to this week's problem! Taken from *my brain*TM. Create a "linear Collatzian rule" of size $k > 2$ that reaches 1 in a finite number of steps (for like the first 500 numbers). Some light programming could be involved.

ADDITIONAL INFORMATION

Definition that I just came up with: A linear Collatzian rule of size k is a piecewise linear function over $\mathbb{N} \setminus \{0\}$ that looks like (using the same notation as above):

$kn \rightarrow n$

$kn + 1 \rightarrow$ multiply and add something to $(kn + 1)$

$kn + 2 \rightarrow$ multiply and add something to $(kn + 2)$

⋮

That's a whole lot of mumbo jumbo to say: come up with some rule that is sort of like the Collatz rule but based on divisibility by a number other than 2. Here is my example (this is my baby conjecture that I'm very proud of!!) Feel free to use the same notation...

$3n \rightarrow n$ (divide by 3)

$3n + 1 \rightarrow 12n + 6$ (times 4 and add 2)

$3n + 2 \rightarrow 6n + 3$ (times 2 and minus 1)

It seems to work for a bit... but who knows! And now it's your turn—come up with your very own, DIY Conjecture... Make sure your rule isn't essentially equivalent to the original

Collatz rule. And if you can prove your rule will always end up at 1, great! If you can't, even better! We will name that rule after you, and you'll have your own spot in mathematical history. Send us your rule (and any program you write or other work you do) to pmclub@gmail.com.

BONUSES

This problem is unlike our other ones because it is a very simple starting point for you to discover your own mathematics. There is no actual solution... I just want you to try going into uncharted territory. Make your own notation and definitions. Try to find non trivial solutions, with rules that generate unpredictable iterations that get super big but still somehow end up at 1... I want to see what you can come up with! Two prizes will be given out, and the more interesting rules or ideas will be given preference. Here are some ideas:

Bonus: Find more than one rule!

Extra bonus: Write a program that finds and checks rules!

Super bonus: Find a (non trivial) way of generating a family of rules!

Mega bonus: Which rules have only one cycle? Which ones have a few cycles? Do some of them have a finite or infinite number of cycles?

EPIC BONUS: What makes a rule more likely to reach 1 for more numbers? What makes it more likely to have longer (though still finite) sequences before reaching 1? Why?

Happy conjecturing!

VP Propaganda, PMC

(If you're wondering why I skipped Problem 3, then you are probably binge-reading *mathNEWS* my friend—very good on you—and probably missed it in the off week. The solutions for POW 2 and 3 are somewhere, in here.)

profQUOTES

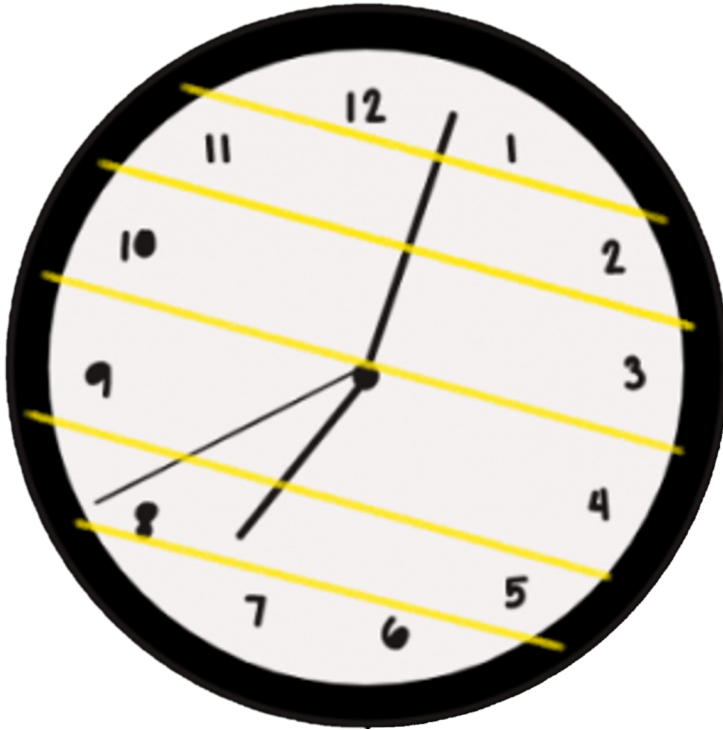
ENGL 306A: CLIVE FORRESTER

- “ We could have had wings, but no, we have language instead.
- “ You see parents playing with their babies, saying, “ooo googooogaga little baby,” and the baby laughs. Of course, the baby's thinking to itself, “Ha, look at this idiot! Why don't you speak to me normally?”
- “ Would somebody give me a consonant sound?

PMC POW SOLUTIONS

TICK TOCK, ON THE CLOCK (POW 2):

This one was pretty simple, and as they say, a picture is worth a thousand words...



MYTHOLOGICAL BEASTS (POW 3):

Congratulations to mcpenguin for their very pretty solution that brought back fond memories of drawing matrices for lin alg! Your prize is: undisputed glory for a week and a chess themed gimmick (alternatively, a gift card).

Solution: The sum of any possible arrangement of eight numbers, with one in each row and one in each column, can be thought of as first a “base” sum of $0 + 8 + 16 + \dots + 56$, where each multiple of eight corresponds to each row, and then adding $+1$ for the number that is chosen in the first column, $+2$ for the number that is chosen in the second column, and so forth. We end up with a total sum of $8 \cdot (0 + 1 + \dots + 7) + (1 + 2 + \dots + 8)$. This can be easily generalized by replacing all the 8’s with n . Thanks to nine year old Carl Friedrich Gauss, we get the total sum:

$$n \cdot \frac{(n-1)n}{2} + \frac{n(n+1)}{2}$$

Which can be further simplified however you fancy. Check out this issue’s problem next—it’s the sexiest POW we’ll ever have so I’ll be offended if you don’t.

VP Propaganda, PMC

MY DIPLOMA

TO THE TUNE OF “MY SHARONA” BY THE KNACK

[Verse 1]

Ooh, no time for anyone, anyone
 All I can think of is my diploma
 Ooh, it’s never any fun, any fun
 I work all day and night just for my diploma

[Chorus]

But I’ll never ever stop, give it up, such a one-track mind
 I always brighten up at the thought of what lies behind
 My, my, my, aye-aye, woo!
 M-m-m-my diploma

[Verse 2]

I always feel so empty, so empty
 My one salvation here is my diploma
 ‘Cause one day it’ll make me free, make me free
 I’ll frolic my days away in sunny California

[Chorus]

I’ll never ever stop, give it up, such a one-track mind
 I always brighten up at the thought of what lies behind
 My, my, my, aye-aye, woo!
 M-m-m-my diploma
 M-m-m-my diploma

[Verse 3]

I’ve never known the birds and bees, birds and bees
 You could say I’m not much of a Casanova
 This loneliness is misery, killing me
 But who needs a life when you’re working on your diploma?

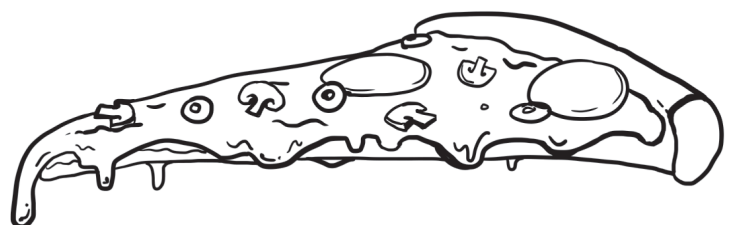
[Chorus]

I’ll never ever stop, give it up, such a one-track mind
 I brighten up when I think of leaving this place behind
 That’s why, why, why, I, I, ooh!
 W-w-w-w-w-w-why, why, why, I, I, ooh!

I’m getting my diploma
 I’m getting my diploma
 I’m getting my diploma
 I’m getting my diploma

Hooooooo-oooh, my diploma
 Hooooooo-oooh, my diploma
 Hooooooo-oooh, my diploma

Finchey



MEMSHR: A SHORT STORY (PART 1)

Originally published on Medium: <https://narayan-s.medium.com/memshr-a-short-story-4889a9ea32a4>

AT THE INVESTORS

I'm running out of time, Annapurna thought, while getting annoyed with another bout of investors asking the same irrelevant questions about her academics, when with every passing second another memory was being lost forever. Some loving parent forgetting how their daughter looked when she walked for the first time, some lover seeing off their army husband for the last time, or another grandparent fading away.

"And what are your current users saying?" asked a suit who was, so far, quiet. Annapurna was ready. "I've managed to get three of my roommates as alpha testers. I pay them by doing their coding assignments for them" — the room did its predictable nasal exhale and chuckle — "and despite the low definition monochrome video, they're beginning to use it more than email for sharing stories and jokes." Annapurna would've preferred if her roommates used Memshr for thoughts deeper than *Cars* set to the tune of *Lose Yourself*, but chalked this up to a sampling bias.

"That's lower than expected for this stage of the service." The quiet suit again. She thought the suit's name was Paula Bell or something. Could barely find anything about her besides a series of thoughtful (and very angry) blog posts. "Yes, but I've been talking to potential users, and what's stopping them is that 78% feel there's a lack of other people using it, and 54% dislike the DIY-ness of the earpiece right now," consulting her notes to check that she got the percentages right.

"Where are you getting those numbers from?"

"A combination of emails, calls, and door-to-doors I've been doing around Waterloo."

"And yet you've only gotten 3 convinced?"

She hated this question because it signaled the end every time. "Almost every single person I've talked to wants to use Memshr. You spend 5 minutes with them and their eyes light up at the mention of them being able to share their memories. But they don't want to jam in a janky earpiece only to find that their nieces and nephews are not on it." The chairs slowly creaked.

"This is going to change society as we know it. Everybody and their Ma is going to be using it, but what I need right now is capital to improve the tech." Despite all the rejections, she wasn't sure why she didn't change the scripted response. It felt wrong to not share the edge-of-a-cliff feeling she had with Memshr.

As always, the room went dead silent.

Except Bell was grinning. She stood up and the other suits followed suit. "We'll definitely keep in touch. I speak for the rest of us when we say that we're excited to see where this goes, but we have to iron out the details first." Annapurna wasn't sure what was happening. It sounded good? She gave some reflexive response in a daze and walked out. She'd have to save and check out this memory as soon as she got to her flat and see why the hell it went well.

AT THE APARTMENT

As she was tapping her snow-ridden boots on the mat and juggling 2 large pizza boxes, Annapurna belched "Honeys, I'm home!" and her roommates responded, somewhat muted. She walked in to the living space to see all three of them plugged in on Samira's Xbox, and very gently placed one of the pizza boxes on their existing pizza box coffee table. A monument that lived for 4–5 months before getting scrapped, like clockwork. The real reason it existed was because they couldn't be bothered to throw out their garbage, but some of the more cultured students at UW did mention that it was a unique commentary on the consumption cycle. Memshr was barely working when the Pizza table was made for the first time, so Annapurna only had the voice recording. Might be worth checking out after she reruns today's pitch.

"I got you guys a box because I felt good about today's pitch," she said, standing akimbo looking at Samira craning her neck at the screen and Sidney barely acknowledging anything beyond it.

"That's fantastic, Anna," said Sidney, still not taking her eyes off of her side of the split-screen. Samira in a similar fashion muttered, "we're glad you're showing it to the Man".

"Don't forget to clean out the box before adding it to the table," she reminded them before returning to her room. It was mostly bad timing, she reasoned. They usually care about her progress. And she did notice that both of them had their earpieces in.

"Now let's see about today." Annapurna took out her earpiece, which was the right half of a cheap pair of headphones attached to her head using a strap from a now defunct backpack. It felt weird not having it there, like taking off a cycling helmet *before* going for a ride. She connected the piece to her desktop and waited a few seconds for a Bash script to transfer all the waves to her local instance of Memshr. After a few minutes tweaking the input waves into a fuzzy video, she exported the files to her running database of memories. Adjusting the input waves felt like her grandparents adjusting the antenna of their television set, only now it was with a mouse and keyboard.

Scrolling down her database, she felt a pull every single time to click through some of them, to see just the first few seconds. But she knew that's how you lost hours and forced herself to sort the memories by newest first. Even the adjusted

video looked like a censored Cronenberg movie, but it was leaps ahead of even last week's best memory. She could make out most audio, text—if it was large enough against a contrasting colour—and people's outlines.

“As you can see, the definition has been improving drastically since then thanks to this Open Source rasterization toolkit I contributed to —”

“And what are your current users saying?”

There. That was the point Bell started talking. Rewinding the memory back a bit, she could see that her head was down the entire time reading her submitted summary. Annapurna then looked out for any hint that explained Paula Bell's interest.

“A month ago, you can make out basic shapes and text against bright backgrounds, even if you don't remember paying attention to it at the time. For example, this is a McDonald's billboard I must've seen as I was taking the bus, but I didn't register it at the time. As you can see...”

Her head perked up at that bit about attention and stayed there. What was it about billboards and attention that piqued her interest? Annapurna made her notes and moved on to improving the rasterization. But not before rewarding herself by experiencing some of her memories with the Pizza Table.

Narayan S.

RETROSPECTIVE: LEAVING HOME

>>> Play it here: <https://chilitrumpet.gitlab.io/leaving>

girafarig:

This time, a game mostly by me. Besides general help and testing, cy went off working on Game Number Four, so you can expect *leaving home* to be shorter than usual (it is) and for the next game to be bigger (we'll see).

Though, this might be the most 'complete' game we've made yet, thanks mostly to the magic of www.puzzlescript.net. Puzzlescript is a really incredible tool, and if this game does nothing but introduce you to it I'd be happy with that. It's powerful but very intelligently restricted, and it's hard to poke around with the tool without getting engrossed in making something.

Because of Puzzlescript, I had the game logic done in like ten lines of code, so there was plenty of time to grapple with the actually-difficult aspects of game creation: making levels. My strategy here was simply to scatter walls, blocks, and targets randomly around a small grid, play it, and poke it in different directions until I get a good level. Sometimes I would take an interesting technique or idea in the process of this and spin it out into its own level. This works, even if it's somewhat of a slow process.

I wasn't surprised at all by how hard this was, though I'm still a bit disappointed in some of the levels I ended up with.

Perhaps there wasn't enough in the premise, but I'd prefer to chalk it up to me not spending enough time exploring and testing. Some levels feel repetitive, like they're testing the same skills as previous ones; some feel like they bring nothing new to the table. Ultimately I can't be sure about my characterization of these levels as I was the only playtester, which also makes me a bit nervous.

After showing the game on Prodigy Night to the other writers, I'm now more satisfied with the levels than before. It seemed like everyone had levels that they found uniquely challenging, and that the difficulty curves out nicely.

Making the art was also refreshingly easy. I never ended up making any sort of in-game conceit for why the boxes you push around behave like how they do, which is one thing I find regrettable about the art. Otherwise, when you get a limited color palette and only 5-by-5 sprites, it's not very difficult to make a reasonable-looking world. Or maybe that's just me. (You can tell where you are supposed to be, right?)

It's getting hot, and I wanted to make a cold game.

cy:

See you next issue!

cy & girafarig

You can drink, you can have sexual relations with whoever you want, but you can't use GOTOs.

PROF. TROY VASIGA

A PLACE TO LIVE PART 2

This is part two of the [A Place to Live](#) series by me, the first one written in 135.2 in October 2017.



It feels like yesterday when I wrote *A Place to Live*, where I reviewed places I lived in during my undergrad. As the University of Waterloo in the process of reopening for fall, many students who have never been on campus will come to this Mecca for the first time in their life. I thought I might as well give the kids a mildly outdated info dump on the residences of Waterloo. Maybe a tier list to boot.



To recap: VI and other student residences—they are expensive, with many services such as meal plans, support groups. Good, solid B-tier from my experience. Keats Way houses have some hidden gems, but risky. Overall, high volatility on pricing and quality, I had a C-tier experience with my lot but I bet you can find better housing if you know where to look. I blacklisted KW4XXXX and AccoXXX8u from my decision tree. (I will decide to write a hit piece if **mathNEWS** ships me a free slice of pizza to India.)



The third residence I stayed in was an apartment at xxx Lester Street by a small company—“XX Rents”. This was my longest stay. The apartment pales in comparison to big players from KW4XXXX or AccoXXX8u. At a glance, this place was a decent middle-range rental. Lester Street is close to campus, yet I was envious of people on Phillip Street. They had a direct path to campus while I had to walk around the Great Wall of residences and then get to campus through the plaza. The residence itself was smaller than most other apartments with fewer accommodations. It did have the most basic stuff and a gym by the time I moved out. The room had adequate space with a standard residence layout. Air-conditioned units, with spotty Wi-Fi. Unfortunately, I had bad roommates again who partied too hard and never cleaned the common places. The most unforgivable part though was how the landlords used the ambiguity of the leases to kick me out in the winter and force me to live there during the fall. Long story short. This little maneuver of theirs made me rank this place from A—above-average decent stay—to D—never doing business with them again. Anyways, it's water under the bridge now. I wish the landlords good health.



That brings me to this lovely place called WXXH northeast of campus at Columbia Street. I was only there for 4 months, sublet-sandwiching between my terrible leases. The best part about the sublet was that it only cost me around \$350ish / month all-inclusive, one of the cheapest places I have ever stayed. The management was also competent and sound. The establishment consisted of three-floor townhouses. The rooms

were smaller than the apartments. I shared a bathroom with another person connecting to my room. Slightly better ratio, but I can imagine cases where the bath would be occupied when you really needed it. I was there during the harshest winter in the KW region. -36°C days without windchill. The ice on the window was about an inch thick! The worst part of this place? Walking up three floors of stairs to get to my room. That doesn't sound much but I was pretty obese at the time. Think about how many good boy calorie points I have lost from unnecessary exercise. I gave this place a weak A.



XXX Westcourt Place, located south of campus. I stayed here for another winter term. The rent was in the 400s, a B- place with A+ prices. The best part was that the landlord allowed me to sign a 4-month lease. The townhouse was almost entirely opposite of WXXH on the map. From my memory, I lived in the quietest, secluded place that's right beside campus. The downside is you will be pretty far from the plaza if you decide to walk. I lived in the basement beside a storage room. The people upstairs rarely came down so I have almost had it all for myself. There was a very comfy sofa in the storage room, much better than the rough bed assigned to my room. I spent more time sleeping in the storage room than in the room I paid for. Unlike other places with good heating and maintaining hot showers, this place had problems keeping the room and water warm because they were still using ancient radiator technology. The loud bang from the pipes woke me up at times. The landlord was intimidating when I was late on my rent payment, and reminded me of a certain GTA 4 character. (Please don't let him know I wrote that.)



WXXI was a one-of-a-kind co-op residence in Waterloo. Co-op means the members / renters are also the owners of the property. ELI5? Communism was going on. That did not mean the rent was going to be cheap. As for me, I had to attend their **mandatory** meetings. The few things I remembered from the meetings were stale chips and chatting, “Without the Communist Party, There Would Be No New China.” I joke. I joke.

I chose this because of the Philip Street location, extremely close to the DC building on campus and the plaza. Much to my surprise, I returned to the dormitory-like layout where we shared a large common room with the rest of the floor. I met many interesting exchange students living in WXXI. The room and windows were pleasantly large. We had great service such as regular bathroom/common room cleaning.

But things always seem nice before cracks begin to form. First was the lack of AC, not a problem as I was only there for fall/winter. The problem arises when the radiator we have follows the same preset for the *entire* building. My room overheated in winter. In fall, there were always crows cawing non-stop every morning on the trees outside my window. It drove

me insane—every morning they woke me up, I leapt to the window, clapping my hands, shouting, until I managed to scare most of the black mass away... Only for them to return 20 minutes later, starting their parties again.

The most unforgettable moment living in WXXI was toward the end of the spring term, the once-in-lifetime ice storm which deposited 50 mm of ice and snow. My CS 350 exam got cancelled. Even Lesley commented on how unprecedented this whole ordeal was. “Boy! No way the school will be cancelled like this again, this must be once in a hundred years!” Me as a sweet summer child, I thought I got more time to study—until the leaky roof decided I not. The entire third floor was flooded with stinky black water from the snow melting and the ice storm. Then the management refused to let me stay longer because of my postponed exams. On paper, WXXI is still an S+ place, no cap. From my experiences though, it's like what Sun Tzu said: “C for Commies”.



I took a DXXUS sublet for my extended terms to complete my minor, this place is quite far away from the UW campus and closer to Laurier. Just in time when I was feeling more distant from my university and peers. Thanks to this relocation, I got to experience a slightly different perspective and taste food from Laurier Plaza. My place was a tall apartment, and I was living the highest place so far. The view was great. This was my first time living in ensuite rooms: I had my own bathroom. A very sharp contrast from the last place. I regret not looking into this type of residence earlier in my academic career. The extra privacy and quietness are worth the cost in my option. The fact that the unit has its own AC is a major plus too. However, I suffered from my usual problems—an annoying roommate that partied at 3 A.M. People before me never cleaning out their fridge so it's all spoiled when I move in. The person I subletted from failing to warn me about repainting the room and forcing me to scam. Despite the minor issues with communicating with management, this is the best place

I have lived in Waterloo, for the low price of about \$400 / month. S for *what a steal!*



Alright, here are the new batches of the housing experiences I am sharing with the world. If you are a lawyer reading this, first off you are an amazing, handsome-looking person. The stuff I wrote is my own opinions, jokes, and even imaginations. I never claimed my experiences as fact, it's stories after all. If you are a student viewing this, I hope I gave you shallow insight from my tales, maybe a few chuckles. I left a few extremely spicy ones for the next part. Stay tuned for part 3 which will be released in 2024! me out!

me

VIGNETTE: THE FUTURE, TODAY

The processed fried onions taste good on the rice spinach and synthetic vegetarian sausage bowl I'm shovelling into my mouth to the beat of *The End of the World [A JoJo's Bizarre Megalo]*, blaring through tinny speakers in my cramped arcology cubicle—within which sits my fancy hi-res NewTech™ neural uplink that I haven't disconnected from in eight days—and I'm excited to read: the government might move to GLOBAL PANDEMIC QUARANTINE STAGE 2 by June so I can maybe go get some processed fried onions served to me by some cute waiterbots instead of through my NewTech™.

CC

(no, no I'm not jaded it's called *artistic license* no wait what do you mean I should go talk to a counsellor)

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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AXIOMS OF RESISTANCE III

I'm spending more and more time in the in the seventh floor MC room—which I now know as Rex Sibyllan's Theorem-Space lab—looking through notes, examining the tools, trying to figure out what can be done about the Anti-Mathematics-wielding geese. No-one gets to mess with the kids I'm teaching and get away with it.

After a few more days I come across a breakthrough in a paper. The unassuming pink tie framed on one wall holds the key. A triumph, and I reward myself with a quick nap. A mistake.



“Hey! *Hey!*” A gruff man's shout jolts me awake. “What's he doing in here?”

I lift my head off the desk slowly and raise my hands. A man and a woman dressed in black Plant Ops uniforms stand silhouetted in the doorway.

“Oh shoot.” The woman, quieter, tinged with panic. “We're in deep now.”

The two exchange a glance and a series of quick whispers.

“Sorry. I fell asleep in here after the meeting,” I try, “I'll show myself out.”

The man whips his head around, eyes narrowing. “No you didn't. No-one's supposed to be in here. Do you know what this place *is*?”

The jig is up. “The late Rex Sibyllan's research lab.”

“And the hell are you doing in it? You from the government?”

“No, I'm a student.”

“Do you know how *dangerous* this place is? People who know the information in here *disappear!*” He's screaming now, voice hoarse with fear. He turns to the woman. “What do we do with him? The hell do we do now?”

She takes a deep breath, raises her hands placatingly, and speaks to me. “Why are you here? Why are you reading all these notes? You must know by now it's all very illegal.”

“Okay...” I collect my thoughts and speak with as much certainty as I can muster. “You must have seen at least some of Rex's notes on the corruption of the mind Anti-Mathematics wrecks.” Nods. “There's someone who's figured out how to do Anti-Mathematics, and they're doing it without regard for the victims—my *students*. *Me*. I came across this lab, Rex's notes, and connected the dots. I need the knowledge in here to fight them.”

“Who's this someone?”

I pause and hide a grimace. “Geese.”

“Does anyone else know about this?”

“No.”

The Plant Ops pair hold another whispered exchange. I count my breaths.

“It... your story sounds ridiculous. Almost too ridiculous to make up. What can we even do to stop you, though? Kill you and hide the body?” The woman sighs as she speaks. “We were Rex's friends; she'd always work late and chat with us while we cleaned. Rex always believed in the freedom of knowledge, especially when it could help out people in trouble. If what you're telling us is true...”

The man continues. “We've been keeping this room off of Plant Ops records, and we'll keep doing so. You can keep using it; we'll even give you a key. One condition: never, ever mention that us two were involved in any way. After this, you're on your own.”

“I... might need more people to do whatever needs to be done. I'm planning on forming a secret society.”

The woman sighs again. “Like I said, we can't stop you. I hope the people you're bringing in have a good sense of discretion.”

“Do you have a name for it?” The man interjects with surprising enthusiasm. The talk of Rex and revival of her research seems to have brought a new light to his eyes.

“I was thinking... the ‘Waterloo Theorem-Space Society.’ WTSS.”

“Dull as all hell. You want something with a little more *punch*.” He slams fist into palm. “It ain't Theorem-space you're concerned about. It's anti-math.”

“The Waterloo Anti-Mathematics Society?”

“It ain't something you *do*, it's what you're fighting! Ah, hell, let me give it to you. All your student clubs are ending with ‘soc these days, right?” A wicked smile. “The Waterloo Anti-Mathematics *Resistance* Society.”

“...**warSOC?**” The Cheshire Cat would be envious of my return grin.

“**warSOC.**”



The goose is once again waiting at the bench looking for unsuspecting victims. I take a seat next to it.

“Have a taste of your own medicine.” I pull out the pink tie and crack it like a whip, focusing my mind like I'd practiced in Rex's lab dozens of times beforehand. I feel the mathematical energy shape itself into a long lance and slash between the goose's eyes. The goose falls off the bench, head shaking back and forth like a dog drying itself. It stumbles backwards into the bushes and collapses into a shivering pile.

I stare at the pink fabric in my hand. Awe. Horror. I glance around to see engaged conversations and faces in phones. No-one seems to have noticed what I just did to the goose.

“Takes Anti-Math to fight Anti-Math. Don't mess with my students.” I say to the goose. It doesn't respond. Based on Rex's papers, it should survive. Probably.



“Thanks for all your help, Mr. Holt! I finally got how the Euclidean Algorithm works and I wanna explain it to you to show you I know!”

The kid's back. Pretty quiet office hours today. “Sure, go ahead, Blas.” He does, exuberantly laying out the Euclidean algorithm and several examples in great length. It's correct.

“Whaddaya think, Mr. Holt?”

“Fine work! And like I said the other day, feel free to call me Soren.” Margaret tells me I should smile more, and I do. It's a difficult thing to teach kids to math, but I do my best.

CC

AUTHOR'S NOTE: AXIOMS OF RESISTANCE

I started this series by typing *Soren founds warSOC* in three parts of 700 words or less in an empty doc. Not much else to write about the content; Axioms of Resistance does what it says on the tin (well, except for running over the word budget a bit in parts II and III—sue me). Hopefully Soren feels a little different in first-person than Sarah.

Diverse lengths make for fun writing. **warSOC** is big and heavy and takes up over two thousand words in some chapters, and is forgiving when it comes to conciseness (though sometimes to my detriment). The new Vignette mini-series is only a sentence or three and demands succinctness, yet is easier to plan than a sprawling serial saga. Axioms is a sweet middle ground. I thought of it as a little writing vacation while I figured out the rest of **warSOC**.

Thanks for reading; hope you liked it!

Also since I'm pretty much blogging on here now I'm still hanging in suspense from Predap's *Tie Guard Part 2*—hopefully we get some answers this issue? Pretty hype!

CC

I'm still giddy-happy about the title it's *almost* something cheesy and cliché like *Sparks of Resistance* except it's *Axioms* so it's *math!* The other candidate was **warSOREN** which was deliciously silly.

“DEMOCRACY” IN mathNEWS



tendstofortytwo

INSTEAD OF WRITING A mathNEWS ARTICLE FOR THIS ISSUE, I PLAYED TERRARIA

God damn destroyer is hard. I don't know why people say it's the easiest mech boss.

aphf

Sometimes you walk by the Comfy Lounge and see things you don't wanna see.

ROSINA KHARAL

THE NAME OF THE FUTURE MONARCH

I am mostly sure that Queen Elizabeth II is not immortal. So, there is a decent chance that one day the Prince Charles, Prince of Wales will become King. Along with the many duties that come with being a monarch, one that is required is to choose your regnal name.

One may think that there is no question or debate as to what the regnal name of Prince Charles will be. He is named Charles so it must be that he will become King Charles, like how Princess Elizabeth became Queen Elizabeth in 1952. That isn't necessarily so.

For example, King Edward VII chose Edward as his regnal name despite being known up to that point as Prince Albert. Albert Edward was his full name, so it's not like it was a hard choice. There had been plenty of other King Edwards but not one King Albert. However, for Prince Charles, it turns out that choosing a regnal name will be a bit more tricky.

There were two other Kings of Britain named Charles so why can't there be another one? Firstly, there is a bit of history. If you look into the history surrounding King Charles I, you suddenly may not want to be associated with him, especially if you are to become a King and your current approval rating isn't so great.¹

Note that this section simplifies history massively. To put it simply, King Charles I was beheaded towards the end of the English Civil War which lasted from 1642 to 1651. His son, now King Charles II, escaped to become exiled in France. After the execution, England was soon declared to be a Commonwealth which eventually became ruled by Lord Protector Oliver

Cromwell as a republic. After Oliver Cromwell's death, his son Richard became Lord Protector but was unable to hold control over the army as he basically had no military experience. In 1660, King Charles II returned to London with the restoration of the monarchy.

You can see that the two Charles² were not exactly monarchs during a good time for the monarchy. I don't think any future monarch would want to be associated with them either, which is probably why there has never been a King Charles III since.

So that most likely leaves out choosing Charles as the regnal name. So what other choices are left? The full name of Prince Charles is Charles Arthur Philip George so let's just go through the rest in order.

ARTHUR

There has never been a proper King Arthur. The King Arthur that most are familiar with is a legendary king from the 5th and 6th centuries, well before the modern line of monarchs. Considering that since the 1066 invasion by the Normans there has never been a King Arthur, it makes the likelihood of Prince Charles choosing Arthur as a new regnal name very slim to none.

PHILIP

Again just like Arthur, there has never been a King Philip. Princes named Philip have been plentiful, the late Prince Philip being one, but the name has never been chosen as a regnal name. I doubt Philip will be chosen as a brand new regnal name either.

GEORGE

Now this is a regnal name with great history. This is the most likely of the four names to be chosen as the regnal name.

There was this time during the early 1700s when Britain had to find a suitable candidate for their next monarch as they were basically without a close heir. The family tree search found a distant cousin named Sophia of Hanover in the Holy Roman Empire, so an Act was passed by Parliament which basically made Sophia the new starting point. There would have been a Queen Sophia but she died two months too early, so instead the first German monarch of Britain became her son George.

That started a line of Georges from George I to George IV. King George I is also when the idea of a prime minister began to form in Britain. After the four Georges came William IV, Victoria, Edward VII then once again George V. After George V came Edward VIII, but one Simpson³ later, it became George VI in less than a year. George VI is the grandfather of Prince Charles.

So, you have the recent (relatively speaking) line of the many King Georges with a fairly light negative historical baggage

Ever wonder how much filler is in a given issue of mathNEWS?

Just count the number of items in all the "N Things" articles.

Oh, and these little blackBOXED quotes.

A mathNEWS EDITOR WHO JUST WANTS TO FINISH LAYOUT AND GO TO SLEEP

attached.⁴ In fact, Prince Charles would probably want some associating with some of the more valiant history of the past Georges as George V and George VI were reigning during the two World Wars.



Out of the four names of Prince Charles, I doubt anything other than George will be chosen as his regnal name. I don't think a curveball will happen like with King Willem-Alexander of the Netherlands. There were three King Williams of the Netherlands before the line of three Queens⁵ before him so there was an expectation that he would choose King William IV, but instead just went with Willem-Alexander.



So expect another King George in the future. Although it's not guaranteed as, in the end, the decision is all on Prince Charles. The Royal Household doesn't really comment about this

matter, and I suspect they will continue declining the question of the regnal name until Charles actually becomes King.

Of course this entire thing assumes that Queen Elizabeth II is not immortal, though I doubt that there isn't a non-zero chance that she is immortal at this point.

boldblazer

1. His approval rating is around the 40% mark.
2. What even is the plural for Charles? Is it just Charles?
3. The Wallace Simpson thing is an entirely new bit of history that I'm not going to explain here.
4. Maybe George III counts with the whole regency thing, but it's not like any of the more recent Georges have been involved in something historically bad.
5. Queens Wilhelmina, Juliana, and Beatrix

TIE GUARD PART 3: INVESTIGATION

After a quick ION trip, Bhavya stood in front of the BlackBox offices. Immediately she was struck by the size... and not in a positive way.

It was a tiny retail unit in a large strip mall, with a sign not even legible from the road the only inclination that the spot wasn't completely vacant. Peering into the blackened window, she could see the hint of a few desks, but the rest of the room was bare.

She checked the time. Ten past two on a weekday.

Definitely strange for a startup supposedly busy enough to hire thirty co-op students. Sighing, Bhavya turned around to head back to campus, to hopefully get a bit of studying done before her 4:00 class.

As she walked away, a lonely security camera blinked on.



A few hours later, she found herself in the MC Comfy, relaxing after class. Spying another BlackBox recruiter outside, she stood up and stretched. The only way that she was going to get some more information was to actually talk to one of them.

Fixing a smile on her face, she took a deep breath and walked up to the man in the black tie. "Hi!" she said cheerily. "I've been looking for a job for the next term."

"Of course," the man said, handing her a pamphlet. Bhavya took it without taking her eyes off his face. "We're recruiting for the fall term and what we're looking for are some highly motivated students who can work off of an existing code base. What level of experience are you at?"

"Well, I've had a few development co-ops where I've worked in JS, done some web dev on the side, you know how it is," Bhavya said, chuckling. "What are you going to need?"

The man nodded. "Alright, sounds like you *might* qualify for one of our Senior Dev positions. Here," he said, taking another pamphlet, opening it up, and showing her the job description. Bhavya nodded, trying her hardest to look intrigued.

"So what would you say I should do if I want to be competitive?" she asked him.

"You're gonna want to work on some Leetcode, we pull a lot of our interview coding problems from there. We also really tend to focus on more recent projects since those are the easiest way to tell how good you're going to be right now."

Bhavya glanced to the side. Pretending that she spotted one of her friends, she smiled and moved to walk away, dragging her hand along the table. "Alright, sounds great! I'm Bhavya, by the way."

Speedwalking away awkwardly, she turned the corner and headed towards the Davis Centre, thinking as she walked. Sure, she had had a conversation... but she was still no closer to understanding exactly what they wanted.

Crossing into the Davis Centre, she headed down the stairs to one of the tables, sat down, and pulled out her laptop. She had to do something.

She pulled open WaterlooWorks. Time to apply to one of their jobs. Maybe then, she'd be able to get to the bottom of things.

Predap

sexNEWS: THE FRIENDZONE?

Welcome back to **sexNEWS**, a biweekly column in which I answer relationship advice questions submitted by you, the readers.

As always, feel free to send your questions to mathnews@gmail.com to be potentially answered in this column. Anonymity is guaranteed.¹ You're also welcome to include additional information to give context that you don't want included in the article if you're worried that your situation is specific enough that fully explaining it would expose you. This column is not restricted to just romantic relationships, we discuss personal relationships as well.

As if I'll ever get this far, would I ask someone out if I consider them a friend, or should I ask someone out before becoming friends?

I HAVE NO FRIENDS

This is a fantastic question, and the answer will vary from person-to-person and relationship-to-relationship.

With some people, you might see them and just immediately be attracted to them. That's how I was with my current partner. On the other hand, they didn't reciprocate those feelings until after we had become friends and gotten to know each other. I've also had crushes on people who I didn't feel any attraction to until we had become friends, so this isn't something that's necessarily going to be the same for you with every relationship you have.

Now, if you already know you have feelings for someone, I think it's best to tell your friends about those feelings sooner rather than later. Almost all the time, assuming everyone is capable of acting mature, asking someone out and having them reject you is unlikely to ruin a friendship, at most things will just be awkward for a couple weeks. Of course, if you start acting like a total weirdo after getting rejected then that's on you. Just like, don't act like an incel if you get turned down and you should be fine.

There are two main reasons it's preferable to confess your feelings sooner rather than later:

1. If they feel the same way, you can start a relationship sooner.
2. If they don't feel the same way, it's easier to get over your feelings sooner. It's a lot easier to move on from someone who you know isn't interested than it is if you don't know if they like you back.

So in summary, I would recommend that you tell them about your feelings as soon as you have those feelings.

Father's Day is coming up. Should I get a gift for my partner's dad, or is that weird?

EXCITED FOR DADDY'S DAY

You should ask your partner what they think, as they probably know their dad better than you. Of course, a card never hurts.

Senior **mathNEWS** Relationship
Correspondent

1. Unless there is a court order or something, but if I foresee that being an issue I probably won't answer the question in the first place. Canada has unfortunately weak laws protecting journalists, and I don't know if this column even counts as journalism.

CALL FOR RECIPES

Hello to all **mathNEWS** writers who like food,

I am looking for recipes from **mathNEWS** writers. Please send a recipe that is meaningful to you, along with your writer name, to mathnews@gmail.com. For example, a recipe for a personal "comfort food". It does not actually have to taste good, but it must be food. Shorter recipes preferred. You can write the recipe yourself or send it from a link. Optional: you can also include a few sentences describing why this recipe is meaningful to you.

By sending me the recipe, you agree for me to put your recipe, or a shortened version, and your few sentences, or a shortened version, in a future **mathNEWS** article. Your **mathNEWS** name will be credited. But don't get too excited yet; you won't see your article until the next on-campus volume (fingers crossed for fall!).

I want recipes from those who have written at least one article. If you have not but wish to submit a recipe, you can send it to me anyway and write an article next issue.

cy

I'd hate to tell you what happened the last time someone submitted something to profQUOTES. It's kinda hard to swim with cement boots.

PROF. STEVE FURINO

MEMSHR: A SHORT STORY (PART 2)

10 YEARS LATER: IN THE FUTURE NOW

The lone alarm in Annapurna's house started playing today's productivity playlist. She got up from her Japanese floor mat and went to the next room to shut it off. In this small room, she began her morning stretches and then moved onto a run on her manual treadmill. She was done in 30 minutes and her playlist automatically stopped. After taking care of other bodily needs, she stepped into her hatchback, tapped her earpiece twice to start recording while driving, and drove in silence to work.

It was a beautiful building that she found excessive. A 15-story building with custom-made blue glass walls spanning an entire city block in downtown Waterloo. It was empty right now, but when it would be full later today, you could see everyone buzzing about for as long as the sun shone. If you looked closer at the windows, you'd see small white polka dots uniformly arranged in a grid all over them. When this building first stood, the clean glass windows fooled birds into crashing and occasionally dying. Being the first one in on most days, seeing dead or dying birds and spending time to take care of them was too much of an emotional toll. So she personally lobbied for those expensive filtered windows to save the local birds. It was an uphill battle because of the exorbitant cost, but her being the CEO of the world's most popular social network helped.

Annapurna scanned in and walked to her office on the ground floor. The only office in the entire building with the back wall made of brick and a dimmable glass front. She started her day with checking her notes for any to-dos and then reading through a curated list of user feedback from around the world, along with an executive summary.

A/B Testing in North America showed that retention increased by 6% with the new notification system that cycled through a pseudo-random selection of updates every day. This system retained youth and the elderly by 14% and 11%—the demographics that mattered the most. An increasing number of users in India were trying more creative methods to get around the government ban on pornography and Memshr's content policy. The machine learning algorithm was getting better, but the workload for the content moderation team in India was not enviable. A final update from Eastern Europe where families who were sharing memories to try and locate missing persons consistently succeeded. These 'Memorys' were saved to be used for building up the legal case for use in policing.

She made note of all of this, and skimmed through the Memorys of Eastern European families finding people they believed to be lost forever. "That doesn't look like we're breaking the fabric of society," she couldn't help saying to an empty, quiet room. Annapurna then checked her schedule for the rest of day. Internal meetings for the whole day and a press meeting with ... a UW newspaper? She noted to make sure that this was actually on her agenda. She had presented

in front of thousands of UW students before, but never had a 'press' meeting with someone from **mathNEWS**, Waterloo's Bastion of Erudite Thought, before.

Narayan S.

DROPPING THE FILLER

It can be hard to let things go sometimes, especially when they're free. This is especially true for me with regards to Webtoons, which I really started reading in earnest back in January. Only a few series ballooned to dozens, and then to the point where some days I was reading close to twenty different new updates, even though I was just skimming through almost half of them. Why even bother?

Well... they were free, and even if they were boring, at least I didn't hate them. It was just something extra. But I could easily be doing something else with all that time.

So, this morning, I started cutting series out of my to-read list. Just the stuff I never really bothered with.

Sometimes it's worth it to take the things out of your life that you've just taken for granted, that just exist because you haven't bothered to remove them, so you can spend your time doing something you care about.

Just don't drop **mathNEWS**. We're worth the time!

Predap

EPISODE 21: RIEMANN INTEGRAL

Enjoy Episode 21 of the MathSoc Cartoons series: *Riemann Integral!* Want to see the next comic when it's released? Follow @mathsoccartoons on Facebook or Instagram! Want to see the next comic BEFORE it's released? Sign up to be a Reviewer at bit.ly/mathsoc_cartoons_reviewer_signup! As always, feedback, suggestions, and fan art can be left at cartoons@mathsoc.uwaterloo.ca.

MathSoc Cartoons

My brain, it's just... gone.

PROF. MARK GIESBRECHT

MATH 138: THE RIEMANN INTEGRAL
 STORY BY MARCUS CHAN
 ART BY @mazui_3

HI CORALI! WHAT ARE YOU WORKING ON?

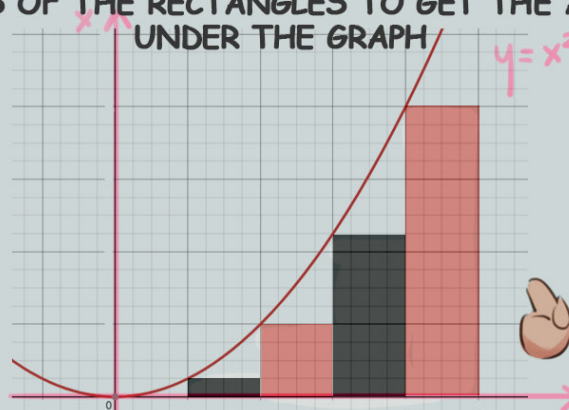
MY SCHOOL MATHS PROJECT!

Cool! Can I see?

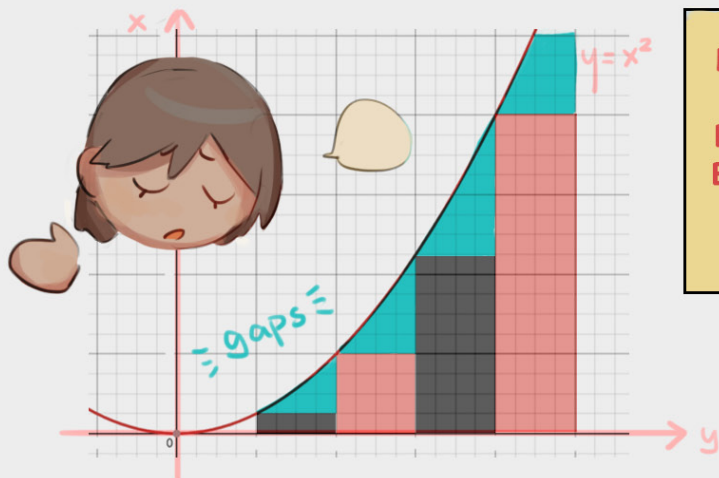
Sure!

OUR TEACHER ASKED US TO FIND THE AREA UNDER THE GRAPH $y = x^2$ FROM $x = 1$ TO $x = 3$, AND THE CLOEST ONE TO THE EXACT AREA WINS A PRIZE!

MY FIRST APPROACH WAS TO OVERLAY RECTANGLES IN THE REGION BELOW THE GRAPH, AND SUM THE AREAS OF THE RECTANGLES TO GET THE AREA UNDER THE GRAPH.



BUT SINCE THERE ARE **GAPS** BETWEEN THE RECTANGLES AND THE GRAPH, THIS SUM IS ONLY AN **APPROXIMATION** TO THE AREA UNDER THE GRAPH.



HOWEVER, IF I INCREASE THE NUMBERS OF RECTANGLES I USED, I NOTICED THE GAPS BETWEEN THE RECTANGLES AND THE GRAPH BECAME SMALLER, AND SO THE SUM OF THE RECTANGLES IS A BETTER APPROXIMATION FOR THE AREA UNDER THE GRAPH.

I WAS WONDERING WHETHER WE COULD GET THE **EXACT** AREA OF THE GRAPH BY CONTINUING THIS METHOD

WE CAN TURN TO THE MIGHTY POWER OF CALCULUS TO HELP US!!

ISN'T THAT YOUR HALLOWEEN COSTUME FROM LAST YEAR?

YOUR OBSERVATION IS CORRECT - AS THE NUMBER OF BARS INCREASE, THE SUM OF THE RECTANGLES' AREA DOES INDEED APPROXIMATE THE AREA UNDER THE GRAPH BETTER.

IF WE HAVE N RECTANGLES, WE COULD WRITE SUM OF THEIR AREAS LIKE THIS -

$$S_n = \sum_{k=1}^n \left(\frac{2}{n}\right) \left(1 + (k-1)\frac{2}{n}\right)^2$$



A SUM OF THIS FORM HAS A SPECIAL NAME - A RIEMANN SUM.

IN FACT, IF YOU WANTED TO KNOW THE EXACT AREA UNDER THE GRAPH,



YOU WOULD NEED TO OVERLAY INFINITELY MANY RECTANGLES OVER THE REGION UNDER THE GRAPH.

WE CAN HENCE REPRESENT THE AREA UNDER THE GRAPH BY THE RIEMANN SUM OF INFINITELY MANY RECTANGLES. SUCH AN INFINITE SUM IS CALLED A RIEMANN INTEGRAL,

AND IN THIS SCENARIO, THE AREA UNDER OUR GRAPH CAN BE WRITTEN AS

$$\int_1^3 x^2 dx$$

WE CAN ALSO WRITE THE RIEMANN INTEGRAL AS THE LIMIT OF THE RIEMANN SUMS AS THE NUMBER OF RECTANGLES GROWS INDEFINITELY:

$$\int_1^3 x^2 dx = \lim_{n \rightarrow \infty} S_n = \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{2}{n} \left(1 + (k-1)\frac{2}{n}\right)^2$$

DOESN'T THIS MEAN IF I WANTED TO WIN THE PRIZE FOR SURE, I WOULD NEED TO SUM INFINITELY MANY RECTANGLES MANUALLY?

WELL, IN MOST CASES, THIS IS THE ONLY METHOD TO CALCULATE THE INTEGRALS.

BUT IN THIS CASE, WE CAN USE THESE SUMMATION FORMULA TO CALCULATE THE INTEGRAL WITHOUT DOING AN INFINITE SUM

$$\begin{aligned} \int_1^3 x^2 dx &= \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{2}{n} \left(1 + (k-1) \frac{2}{n}\right)^2 \\ &= \lim_{n \rightarrow \infty} \frac{2}{n} \sum_{k=1}^n \left(1 + \frac{4}{n}(k-1) + \frac{4}{n^2}(k-1)^2\right) \\ &= \lim_{n \rightarrow \infty} \frac{2}{n} \left[\left(1 - \frac{4}{n} + \frac{4}{n^2}\right) \sum_{k=1}^n 1 + \left(\frac{4}{n} - \frac{8}{n^2}\right) \sum_{k=1}^n k + \left(\frac{4}{n^2}\right) \sum_{k=1}^n k^2 \right] \\ &= \lim_{n \rightarrow \infty} \frac{2}{n} \left[\left(1 - \frac{4}{n} + \frac{4}{n^2}\right)n + \left(\frac{4}{n} - \frac{8}{n^2}\right) \frac{n(n+1)}{2} + \left(\frac{4}{n^2}\right) \frac{n(n+1)(2n+1)}{6} \right] \\ &= \lim_{n \rightarrow \infty} \frac{2}{n} \left[\frac{13}{3}n - 4 + \frac{2}{3n} \right] \\ &= \lim_{n \rightarrow \infty} \left(\frac{26}{3} - \frac{8}{n} + \frac{4}{3n^2} \right) \\ &= \frac{26}{3} \end{aligned}$$

$$\sum_{k=1}^n 1 = n$$

$$\sum_{k=1}^n k = \frac{n(n+1)}{2}$$

$$\sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$$

WE CAN THEN USE SUM AND LIMIT ARITHMETIC TO CALCULATE THE INTEGRAL.

OH, THE $\frac{8}{n}$ AND $\frac{4}{3n^2}$ TERMS BECOME ZERO AS n GROWS LARGE, BECAUSE THE DENOMINATOR EVENTUALLY OVERPOWERS THE NUMERATOR!

SO THE AREA UNDER THE GRAPH $y = x^2$ FROM $x = 1$ TO $x = 3$ IS EXACTLY $\frac{26}{3}$

I'M HAPPY I DID NOT HAVE TO INTEGRATE AN INFINITE AMOUNT OF TIMES TO WIN THIS PRIZE!

WHY I LIKE BIKING

It is now the second (hopefully last) summer of the pandemic and so in May I thought I'd pick up a new hobby: biking. For those who know me personally, any form of exercise is unprecedented. But, biking appeals to my personality in a particular way. Why?

EXPLORATION

I grew up in, and currently reside in Brampton, which is basically a giant suburb. So, I went a lot of places via car, and this resulted in me conceptualizing my hometown as a bunch of notable landmarks connected by roads of indeterminate length. It turns out, when you have to ride a bike between these places, the length of these roads becomes very determinate. Now, you might say, running also lets you explore the neighborhood, and shoes cost much less than bikes. But, running is slow. You slap your feet on the pavement for an hour, like a peasant, and you find yourself down the street. Biking is faster.

COMMITMENT

I am a person prone to giving up. It is 12:23 AM on production night and I have given up on this article twice already. However, biking is a hobby uniquely designed to thwart this personality attribute. First, if you bike out to some location, you have no choice but to bike back. No giving up or changing your mind. If you wish to ever sleep in your own bed again, you have to get back on that saddle and head back the way you came. The same thing applies to hills. Either you keep pedaling up that hill or you stop on the side of the trail, like a schmuck, or pathetically roll backwards down the hill, like a schmuck.

IMPROVEMENT

Biking offers opportunities for quick improvement. For example, I noticed I was having trouble climbing hills. Then, I realized my tires were underinflated, and I re-inflated them, and *bam*, massive improvement. A similar phenomenon occurred when I realized my bike seat was too low. Suddenly, my speeds jumped up from "abominable" to "normal". Biking gives me the chance to work hard and see improvements.

So, jump on a bike this summer. If you have one in your garage. If you don't, be prepared to spend like 600 dollars or something.

UW Unprint

THE BACKYARDIGANS AS A K-POP GROUP

The Backyardigans were a co-ed 5-member group under Nickelodeon Animation Entertainment. The members consisted of Pablo, Tyrone, Uniqua, Tasha, and Austin. The Backyardigans debuted on October 11, 2004 with their EP "Pirate Treasure". They officially disbanded on July 12, 2013.

Fandom Name: Fence

Fandom Colors: Yellow & Spring Green

MEMBER PROFILES

Pablo:

- Main Dancer
- Lead Vocalist
- Center
- Face of the Group

Tyrone:

- Main Rapper
- Lead Dancer
- Vocalist

Uniqua:

- Leader
- Lead Vocalist
- Lead Dancer
- Lead Rapper

Tasha:

- Main Vocalist
- Visual

Austin:

- Vocalist
- Maknae

Deriving for Dick



I basically only read the profQUOTES.

MOST PEOPLE WHO READ mathNEWS

MEMSHR: A SHORT STORY (PART 3)

AN INTERVIEW WITH mathNEWS

She was shocked and confused. This ‘reporter’—that was too strong of a word for a student volunteer at a newsletter—had been at Memshr’s heels for at least a year. Knocked on the doorstep every month, without fail. They sent tailored emails to every single person in the Marketing team *across the world*. Hounded team members on LinkedIn. Called any support line they could find. Sent physical mail repeatedly. And even sent a *telegram* to this office a month back. This person used every avenue available to them except training pigeons or contacting the team at Memshr. In every failed interaction, their message was clear. They wanted to meet Annapurna for 15 minutes.

Annapurna climbed to the press room on the fifteenth floor. The flipped structure of the building (executives on ground level and public-facing on the top) was the architect’s idea of subverting corporate hierarchy, but was a pain to actually deal with. The press room was one entirely glass box that sometimes needed cooling even in the winter because of all the trapped heat. The metal chairs facing the podium reflected the sunlight and the noise of the busy street below was a faint buzz.

There were two people in the room, talking as if they were old friends. One was Fang, from marketing, who Annapurna noticed was not wearing her earpiece. This went against the unspoken rule at work and especially against the actual rule at Marketing. Annapurna would have to bring it up to her superior. The other person was a whole other story.

They wore a white baseball cap with no logo but had dirt in some places. Instead of regular glasses, they had on something that looked like Safety glasses with a green tint. Their last accessory was a black and white Rorschach mask that looked like it was smirking. They sat with their elbows on both knees, completely absorbed in what Fang was saying as she was drying up tears of laughter from the corner of her eyes.

As soon as Fang saw that Annapurna was in the room, she stood up and waved. The other person was slower to act and despite the eye wear, Annapurna felt she was being scanned. “This is TC from **mathNEWS**,” Fang said, putting her hand on TC’s shoulder.

“TC?”

“Well, before we get into *that*, I had two quick questions. Firstly, would you kindly please remove your earpiece for this conversation? Secondly, do you believe that Memorys could be used as evidence in courts right now, with an assumption that they are stronger than witness testimony and closer to a recording? Just a yes or no.”

This person does not screw around with niceties for me, Annapurna thought. If she answered no to the second, then that could be used as evidence against using Memshr in the courts. If she

answered yes, then by section 184 of the Criminal Code, TC just revoked consent. Smart.

Annapurna tapped her earpiece twice to stop recording, and after years of keeping the piece in, she removed it. It felt like watching your phone break and the internet going off at the same time, before driving to a place you’ve never been to. The immediate fear that these memories would be lost forever almost forced her to put it back. She was done being nice. “I also revoke my consent to any recordings and anything you quote has to get vetted by us or we sue.” TC reached into their pocket and pulled out an ancient digital recorder that was recording so far, pressed the red square stop button and nodded like one old chess player to another.

Annapurna wasn’t fuming, but wasn’t cool either: “How about you tell me why I shouldn’t walk away right now and block you on everything?”

“I’m sorry I was being a hardass earlier. It’s just the approach that works for smart, rational people whom I don’t know well personally. You can walk away at any point you want, but I guarantee you I’ll be asking some questions you’ve never gotten before. I know that because I checked.”

“Checked what?” Annapurna noted that her tone was cooler now and she felt, somehow, more comfortable after hearing their voice.

“I’m confident that I checked everything that was publicly available,” TC answered, like it was nothing. “For example, many people know that Memshr aggressively acquired companies starting in 2006. Some people know the big names. Fewer know that you purchased a *tiny* company, I’m talking 2 founders and 3 interns, by the name of “The Facebook” in 2006 for around half a million. Chump change, really. What very little people know, is that one of the founders, Mike Zuckerdog, was the only holdout. I emailed Zuckerdog a couple times and he told me that he was convinced after this one closed door meeting with you. He declined to say anything else. My first question is then how did you convince, as far as I can tell, a stubborn S.O.B. to part with his ‘reason to live?’”

Annapurna wasn’t impressed with the depth here. It wasn’t impossible to find this information, but the hardest part would’ve been having a conversation with Mike. Maybe mildly impressed. Annapurna had the Memory of it, of course but she wasn’t going to show it to TC. “Before I answer that, what’s with the name and getup?”

“I don’t consent to having my face stored in millions of databases where they could be used to identify me when I don’t want to, or for them to make money. To me, it feels unnatural that giving up your likeness is the norm and wearing masks isn’t. I’m sure some years from now, we’ll all be wearing masks unless legislation changes ... I could also be horribly scarred from an accident involving acid and

lightning.” TC laughed and Annapurna chuckled despite herself.

“The name is something I use in work correspondence. The people I know and love, and only they, know my real one.” TC answered, with no inclination towards sharing it, and waited for her response. In spite of their flagrant eccentricities, she’s heard of people with views similar to theirs but never met a person who’d went all the way.

“I can tell you what I remember. Mike struck me as someone who wanted to express himself through his work, and was convinced Facebook would do the world good. So I told him what I thought would convince me. That if he cared about that, no one would be using a service that shared photos and relationship statuses when you could share honest-to-God memories from your brain. And that he was receiving a pretty penny to express himself in other ways.” Annapurna said, trying to look as if she was recalling a memory.

All of this was a complete lie. What happened was a brutal, long, and loud match where Mike threatened to “destroy” Memshr and proceeded to lose his shit. Screaming death threats and vile abuses like a child. Mike didn’t know that the room was bugged. So it was either signing or seeing that information go public. She was sure that The Facebook wouldn’t have been a threat in the long run, but having a similar competitor that early in the game could’ve been unpredictable.

“Huh, I’m surprised Mike was so civil about it,” TC answered, their arms now crossed and leaning back. Annapurna had an inkling that TC knew the answer before they asked it. She was now more impressed.

Annapurna laughed as well as she could. “Yeah, I can see Mike giving off those vibes. But once you get to know him, you realize he’s a calm person with child-like curiosity who cared deeply about his image,” she said, and gauged whether TC got the hint.

“I see. It looks like you understood Mike well and showed him sides of himself he didn’t know was being ... noticed.” That pause was not subtle but TC did lean in closer and uncross their elbows. “Since we’ve both established we’re not idiots, I’m not going to ask you any more questions about your past. My next, and last, question is this: when will it be enough for Memshr? You’re already the most used social media network in the world, you’re pinning for introduction into governmental and medical use, and your next closest competitor is banned in the U.S. When will you say ‘it’s been a good run?’” TC asked, less calm than they’ve ever been today.

Annapurna *hated* this line of questioning. Hearing this after years’ worth of opinions about their net negative effect on humankind was reaching a limit. She had enough.

“Listen. I don’t understand why you and so, so many others frame us this way. This framing that Memshr ought to stop because it’s growing too fast. Because what’s happening is

unprecedented. Do you have any idea how much good we do? We’re the closest shot people have at immortality unless Musk and Walt Disney have a weird robot baby. Not even counting the ability to save the memories of your loved ones forever, through sickness, old-age, and death; we’re saving actual fucking lives. More people are being found after going missing, people with memory disorders use Memshr as a doctor-recommended recovery tool, and probably a dozen other ways we don’t even know about. If people feel violated or oppressed or whatever, they can just stop using Memshr. That’s another thing I want to remind these people about. Just *stop* using it. If you have some inability to not use our service then it’s either that you’re not being sincere about the value we bring, or you have a problem. So my answer to your loaded-as-heck question is never. We’re not going to stop until we have a definitive market-based reason for stopping. If people have some newly discovered moral issue with us, that’s what legislation is for, which we will — and have, mind you — gladly comply with. Until then, we’re going to be providing the best service we can.” She wasn’t sure why she went on for so long. Maybe knowing how illegitimate **mathNEWS** is. Or that she was just tired.

TC was quiet and observing throughout the whole response and it looked like nothing changed once she was done.

“Thank you. I have no more further questions. I’ll be sending a rough draft of what I’ll be writing sometime soon. Thank you for your time.” TC reached out their hand and Annapurna shook it. Funny, she thought, she didn’t know TC had gloves on this entire time.

With that, TC left the room as quietly as they must have come in and the room was silent. The sun was setting and its gleam shone off the metal chairs in the room like so many mirrors. In all of the chairs except Annapurna’s, where she sat a bit longer and reflected on what she had done.

Narayan S.



SUN JUNE 20

First day of summer ☀

MON JUNE 21

TUE JUNE 22

Cycle 2 Posting 1 applications due 9 A.M.
Fall 2021 course selection period ends

WED JUNE 23

Alan Turing's 109th birthday

THU JUNE 24

Deadline to request removal from Cycle 2 interview/match process 12 P.M.

FRI JUNE 25

Tuition and fee refund deadline — 50%
Cycle 2 interviews begin

SAT JUNE 26

SUN JUNE 27

mathNEWS 146.4 production night

MON JUNE 28

TUE JUNE 29

Cycle 2 Posting 2 applications due 9 A.M.

WED JUNE 30

Canada Day 🇨🇦 (classes cancelled)
Gottfried Wilhelm Leibniz's 375th birthday

THU JULY 1

FRI JULY 2

mathNEWS 146.4 released
Canada Day Part 2 (classes still cancelled)

SAT JULY 3

LAST ISSUE'S gridSOLUTION

1	C	A	2	R	D		3	P	4	I	5	D	6	A	7	Y
	O		I			8	M	A	R	I	N	E				
9	M	U	G	S			10	P	A	S	T	A				
	F		H			11	M	A	T	H					R	
	Y		T					12	E	O	N					
		13	G	A	14	S					N			15	E	
16	B			17	N	O	18	D	E			E			X	
19	A	20	N	G	L	E			21	A	S	I	A			
22	S	I	L	V	E	R				T					M	
23	S	L	E	E	P			24	E	Y	E	S				

AND THE WINNER IS...

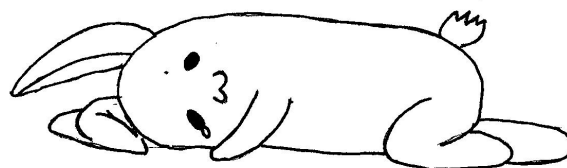
gridCOMMENT RETROSPECTIVE 146.3

The standard prize (of fame and glory) for a correct gridWORD solution goes to π , who writes in answer to the question, "What are you missing (or not missing) about life in MC during a normal term?":

This gridWORD solution comes from a solver who also hasn't been a student for a while.

I'm not missing solving the gridWORD, since I get to do it remotely.

That 80's Girl



Apologies for the lack of gridWORD.

Send your anger, pitchforks, and weapons of mass destruction to mathNEWS@gmail.com (or MC 3030).

THIS mathNEWS EDITOR IS COWERING IN FEAR OF YOUR WRATH. PLEASE BE GENTLE I BRUISE EASILY