



## "HOW WOULD YOU PROPOSE TO THE DEAN OF MATH?"

Salutations dearest readers, skimmers, perusers, and all those whom I have not already included in this list. A time of excitement is upon us.

The new academic year is off to an intense start! With orientation week squished into a handful of days, the first weeks of classes packed with new subjects, and Hack the North depriving many of some much-needed sleep, it's been hectic. First-years, enjoy the beginning of term while it lasts...

It's a funny thing to begin a new year. Upper-years will know that the vibe in a room at the start of Fall term is very different now than it was in first year. Every start of year has its own flavour, its own character. This year is no different, especially for **mathNEWS**.

This year's first production night was bopping! At 18:30 on Monday the 16<sup>th</sup> of September, a veritable battalion of veteran and newbie writers descended from the MathSoc office to one of the brand new Mac labs to write articles and earn their fill of pizza. They took to working straightaway and churning out an extensive array of articles for you to enjoy. Let me say that this strong start has left me pumped to see what is to come for the rest of the term.

On another note, those of you who remember last year's first issue will remember a hooligan who ordered a gluten-free pizza with 10 different toppings. Well, that writer has been succeeded by a vegetarian who ordered 11 toppings on their pizza. One of the highlights of production nights is ordering pizzas of a more creative variety, and pizzas like this really make it what it is. The folks over at Pizza Nova have even come to expect our order and were concerned when we did not order in a couple of weeks ago.

In addition to a squad of new writers, we also have a seasoned writer who has ascended to the rank of editor! Please extend a warm welcome to clarifiED! This editor has already been hard at work on this issue, so we cannot wait to see what ~~mistakes~~ special flair she brings to **mathNEWS** issues to come!

Enjoy this thicc issue to start off your term on a high note! Until we meet again in fourteen days and nights!

unsophisticatED  
Editor, mathNEWS

terrifiED  
Editor, mathNEWS

FINCHEY	With a lady's best friend—a 460 carat diamond (mined from war zones in sub-Saharan Africa, for authenticity)!
UW UNPRINT	I'd get down on one knee in M4 (it's a long term plan), icosahedrons would rain from the ceiling, it would be magical.
ZETHAR	I would use a bound copy of his notes and propose on the dedication page... Oh wait, Dr. Watt, not Dr. Goulden? Er, let me get back to you...
AC	A binary candlelit dinner, just the 10 of us.
BOLDBLAZER	$\mathbb{P}(\text{You} \cup \text{Me}) = 1$
GIRAFARIG	$\mathbb{P}(\text{You} \cap \text{Me}) = 1$
WALDO@<3.LE-GASP.CA	With Feridun's pay and benefits, but more likely with a hand-made Dean's tie.
THE 42 <sup>ND</sup> DODECAHEDRON	With a 3600-sided die, of course.
TILLOW PRINCESS	With open arms, and open legs, and an open mouth.
AUTOWIRED	Construct a ring with a micro pink tie.
CAT	meow?
PIKACHU LAUNCHER	Step 1: Draw a Cartesian grid. Step 2: Put two models on the grid. Step 3: Roll for initiative.
SANDWICH EXPERT	I don't know him.
KRONICMAGE	$(x^2 + y^2 - 1)^3 = x^2y^3$
EPSILON SCREWN	Watt do you think about making a finite simple group of order two? *offers ring*
WATER	With $\mathbb{Z}[u][i]$ .
DAWDLING	With a dowry of every issue of the 140 volumes of <b>mathNEWS</b> .
UNSOPHISTICATED	Disguise my marriage proposal as a grant proposal.
TERRIFIED	I'll take him to Atimpoku, Ghana and force him to swim upriver until he submits. We'll then romantically float downstream, as he is Volta times current.
CLARIFIED	With my grandmother's wedding ring. It's sentimental, it doesn't break the bank, and luckiest of all — they both have the same ring size (I checked)!

## ARTICLE OF THE ISSUE

Djao's Office Hours: A Narrative. By jeff. \$25 gift card. MC 3030.

# Turn Kneel down for Watt.

TERRY CHEN, mathNEWS EDITOR FOR FALL 2019  
ALONG WITH JAMIE ANDERSON, JOSH RAMPERSAD, AND CLARA XI

# LAWYER UP: YOUR STUDENT ASSOCIATION NOW PROVIDES YOU LEGAL REPRESENTATION!

Waterloo undergraduates who elect to pay the Legal Protection Service fee (\$9.56 termly for regular stream students, and \$17.94 per academic term for co-op students) will now have access to a legal aid helpline and lawyers. The program covers legal representation for housing & tenancy, academic and employment rights, as well as a helpline for any legal questions.

The contract was negotiated over the last three months by your Vice President of Operations & Finance, Seneca Velling and approved by your Board of Directors on July 30, 2019. On August 15 it was executed by representatives of StudentCare and WUSA.

## LEGAL ASSISTANCE HELPLINE: 1-833-202-4571

The Legal Protection Service covers an aid hotline that allows you to ask questions on any area of the law, including immigration and criminal matters. This can also be used to arrange review of your leases or sub-tenancy agreements for housing in the Waterloo Region, ensuring your landlord or property management firm complies with the Residential Tenancy Act and applicable city bylaws, including licensing.

For more information on housing & tenancy rights, check out our Local Advocacy webpage (<https://feds.ca/advocacy/local>) with work from your VP Education, Matthew Gerrits.

## LEGAL REPRESENTATION SERVICES

You're now able to access a lawyer on any issues related to: academic rights, housing & tenancy, and employment (including contracts). What does this look like?

### HOUSING & TENANCY RIGHTS

- Rent issues
- Lease issues
- Apartment safety
- Major repairs
- Apartment repossession
- Representation in the Landlord & Tenancy Board (<http://www.sjto.gov.on.ca/ltb/>)

### EMPLOYMENT RIGHTS

- Contract issues
- Workplace harassment and abuse
- Wrongful termination
- Discrimination concerns

### ACADEMIC RIGHTS

- Appeals and final appeals
- Suspension
- Academic and non-academic misconduct

- Plagiarism

And don't worry, if it's not listed above, you are more than likely still eligible if it falls within those categories generally.

Any costs of your legal services are covered by the program, including:

- Lawyer or bailiff fees
- Legal expenses (disbursements) such as court fees or adverse costs awarded
- Attendance fees
- Missed wages
- Witness expenses
- Experts' fees up to a maximum of \$1,000 per case

## WHO'S COVERED?

All full-time and part-time undergrads who are members of the Waterloo Undergraduate Student Association (WUSA, formerly Feds) and do not opt-out of the Legal Protective Service fee can access the program. This includes all international students, co-op students on officially recognized work terms, and anyone attending Waterloo or studying on an officially recognized exchange.

You should know, if you opt-out of the Legal Protection Service, you lose all access to resources including the toll-free legal helpline, as well as access to legal representation. Opting out at the beginning of the policy year means you cannot opt back in at any point during that policy year, with some exceptions. Check your Quest Fees Statement to make sure you're covered! For more information on your fees, check out [www.wusa.ca/fees](http://www.wusa.ca/fees).

Enjoy your coverage!

Best wishes and see you in September,

*Seneca J. Velling*  
Vice President, Operations & Finance  
Waterloo Undergraduate Student Association

Seneca can be reached by telephone at 519-888-4567 ext. 33880,  
or on Twitter through [@YourwusaVPOF](https://twitter.com/YourwusaVPOF),  
or in person at the Student Life Centre, Room 2118M

**Ceci n'est pas filler.**

**A SURREALIST blackBOX**

## CAMPUS POLICE CRACK DOWN ON JAYWALKING

**WATERLOO** — After an extensive deliberation period, the CrossSafe initiative is entering phase two. Starting this fall term, UW Police are authorizing geese to use lethal force as a countermeasure against jaywalking. For now, the authorization covers all of Ring Rd., but they are hopeful that CrossSafe can be extended to the major roads surrounding campus by Winter 2020.

While law-abiding students will perceive no difference, those who choose to cross outside of marked areas can expect to face serious penalties. "Violators may be executed on sight," a spokesperson announced. "If they please, the geese will run people over and bite them to death if the cars do not get them first."

Quite poetically, both geese and cars will honk very loudly before taking their victims. "It really was a no-brainer to use geese. They cost students and taxpayers nothing, and they were doing it anyway." However, when asked how geese knew how to identify legal pedestrian behaviour, UW Police had no comment.

In preparation for their new roles as enforcers of pedestrian safety, geese have also laid fecal warning markings in no-cross zones. A student we caught jaywalking (who chose to remain anonymous) remarked: "I think I'll keep on doing it. Those extra 2 minutes of sleep are too precious, even if it means I have to jump over dumb goose shit." The student could not be found for further comment.

Some have questioned the severity of the punishment, considering that even a violation of Policy 71 does not warrant death. However, such concerns were resolved when the Faculty of Mathematics announced public execution by lethal goose bite as a suitable penalty for plagiarism.

Don't jaywalk, folks.

water

## FEDS BAD, WUSA GOOD

every time someone says feds a goose is killed

save the geese

when i say "wu" you say "sa"

wu

sa

honk

## ORIENTATION LEADER THOUGHTS

*A COLLECTION OF COMMENTS MADE BY MATH ORIENTATION LEADERS DURING AND AFTER ORIENTATION WEEK.*

Orientation week.

Oh man, how I miss orientation week.

From the endless food to the silent disco — and everything in between — Orientation Week 2019 was one to remember.

Seeing the little kiddies go from being reserved and shy as fuck Monday morning to cheering their ass off and earning their ties the next day — this is what makes running around at 7am every day and and get pied in the face multiple times completely worth it.

Thank you, first-years.

Thank you, leaders.

Thank you, EDCOM pls spare me from your wrath.

and to the people in red vests, I still don't know who you are.

honk

## ARE YOU LIVING WITH ROOMMATES THIS TERM?

If so, consider having a house meeting!

It can be a bit of a pain to get everyone together, but it can be a great time to:

- Develop a cleaning schedule.
- Establish house rules (quiet hours, house guest policy, dishwasher etiquette).
- Start a group chat (Messenger, WhatsApp, etc.).
- Meet each other face to face, which will probably make any group chat interactions less passive-aggressive or aggressive-aggressive.
- Share contact information. make sure you have each other's cell phone numbers and/or email addresses to pass on any important information.
- Also make sure to have each other's emergency contact information so you can contact a friend or family member in an emergency situation. Discuss what qualifies as an emergency situation (suspected depressive episode? drinking problem? in a coma?).

Admin Adam

# ONE DAY WITHOUT INTERNET

Some of the Canada's major mobile service providers experienced network outage across the country due to...who knows why. Maybe there was a hacking attack and the government's trying to hide something since there's no existing information explaining how that happened. And nobody seems to care why that happened since they were busy interrogating their service providers about when would the internet be back up again. This network outage included cellular service, broadband and dial-up internet, home phone service, and television. Since internet issues were the most reported, let's imagine what would have happened if the internet went down across the world for one day.

**[00:00]**

"Data reset. Begin simulation". Lines of code appear on a monitor within a quiet computer lab. It then shuts off, like all the other computers.

A guy was busy killing his enemies online. The internet shuts down just when he is about to level up. Heartbroken, he can feel the indescribable pain in his chest rising up.

**[06:00]**

"It's a brand-new day! Good to be alive." A backcountry camper starts his day packing up. He plans to discover a new trail in a national park. It's a place that even GPS signals cannot reach. The only tool for navigation is a waterproof paper map.

**[07:00]**

A girl is awakened by her alarm. She presses the stop button with eyes closed but impatiently takes a deep breath, then stretches a little. "Shit, it's only 7. Who the hell invented morning classes?" She habitually opens Instagram.

"No internet connection."

"Fucking building doesn't even have working Wi-Fi." She then switches on data. Same result. She slams her phone in bed and moves towards the bathroom while scratching her head.

**[08:30]**

"Internet in my building is down today."

"Oh really? Samee!"

"What? I thought it's just me!"

"I want to make a post on Reddit, but I can't even do that. The heck."

"Exactly!"

Class starts.

"Slides will be posted on Learn." The prof pushes up their glasses with an index finger.

A student raised their hand. "Well, I don't think so. School internet is down."

"Well I thought it's just at my place. I guess that's a problem," the prof replied.

**[10:00]**

INSIDE MANY TECH COMPANIES.

"Well, since we no longer need to provide services or maintain our sites, let's play poker!"

INSIDE THE HOUSE OF A 2-YEAR-OLD.

She's playing Lego (Well...smashing them together) and clearly not affected by the internet outage.

**[12:00]**

"Woah. Since when do people watch news? And on TV? Is this what? Like 2010?"

"I agreed to meet my friends in the lobby, but they're not here yet. Crap, I don't even have their numbers."

**[20:00]**

Only one thing to say: people are bored. Except a few.

A small crew turn on their boombox, play downloaded music, make a cup of coffee, open a paperback book, and sink in the couch elegantly while considering all the other whining creatures as losers.

**[22:00]**

People go to bed early when they are bored, except for party people and chronic insomniacs.

**[23:59]**

"Terminating simulation..."

"Data saved."

And assignments are due tomorrow.

*Autowired*

# A REVIEW OF MUSICAL FRUITCAKE

*THE BEST A CAPPELLA ALBUM EVER PRODUCED, AND POSSIBLY THE BEST ALBUM OF ANY GENRE EVER*

Listen to this album at [https://www.youtube.com/playlist?list=OLAK5uy\\_kK0g6oPTkJg8M7iiV5WSz0QMq3Y-Yf7Xk4](https://www.youtube.com/playlist?list=OLAK5uy_kK0g6oPTkJg8M7iiV5WSz0QMq3Y-Yf7Xk4) or search "The Klein Four Musical Fruitcake" on YouTube

I recently discovered The Klein Four, an a cappella group which sings math songs. This is a review of their best, and unfortunately only album (as far as I know): "Musical Fruitcake". They have produced at least one single which is not a part of this album called "Get Tenure", which is a parody of "Get Lucky".

Here is my review of "Musical Fruitcake".

## POWER OF ONE

The album opens strong with *Power of One*. This is a catchy love song with a good beat. It has an unfortunately long intro though. Its lyrics also provide inspiration for possibly the best math pickup line of all time. "If you were a number you'd be 1, because there's no power high enough to make you anything but the one for me."

## FINITE SIMPLE GROUP (OF ORDER TWO)

This love song is what brought The Klein Four to fame, and is also my new favourite song ever. Every lyric of this masterpiece is a beautifully crafted math pun. The song tells the tale of a relationship going through a rough patch, and is presented in the form of a mathematical proof that the couple belongs together. My favourite lyric from this song, and indeed from all of music is "without loss of generality, I will assume that you feel the same way" which I wish I could say (and get away with saying) to my crush when I tell them I like them.

## THREE-BODY PROBLEM

This is a fast-paced love song about how the singer's girlfriend left him for another man, leaving him with a three-body problem. The math puns are a little too applied for my taste, but it is nevertheless a fantastic and catchy song.

## JUST THE FOUR OF US

This is a catchy song whose rap verses rival that of the musical *Hamilton*. My favourite lyric from this song is "Academics, women, Nintendo, pick two out of three." I guess to update this you could replace Nintendo with League of Legends, but let's be honest, even if you sacrifice academics, if you play League of Legends, you aren't getting any women. The song is about the four singers in The Klein Four, "and some other random guy" and their adventures doing math together. It also reflects on getting rejected from MIT.

## LEMMA

This is a slow love song, but it's not about being in love with a person like the other songs in this album. This song is about being in love with a really useful lemma that allows you to solve lots of math problems. This makes the song more relatable to most math students than the rest of the album.

## CALCULATING

This is a quite unique song. It is about being lost in math. My favourite lyric from this song: "Is this thing a donut, or just a coffee cup? I just can't tell the difference." This song has a big of an echo feeling to it, not my favourite song in the album, but the beat is pretty catchy.

## XX POTENTIAL

For a math a cappella song, *XX Potential* is somewhat lewd. It's a sexy song about a hot girl in the singer's math class. It also has a bit of a kinky femdom vibe to it, since the singer sings about the girl emasculating him. I think this is a great song, because that's my kink.

## CONFUSE ME

This is the most relatable song in the album. It is about your math professor confusing you. You should sing this song to your professor whenever you're confused in class. The best lyric from the song is: "I keep trying to study, but all you do is confuse me."

## UNIVERSAL

This song has a less math-y vibe to it, but I think that's just because most of it flies over my head. My best guess is that this is a love song full of puns about universal algebra, since it mentions the word "category" and category theory is one of the many places I got lost when trying to read up on universal algebra. This is a nice slow song, good for dancing with that special someone. Shout out to my prof Ross Willard, who I'm sure would love this song, as universal algebra is his research area.

## CONTRADICTION

This is a fun song about proof by contradiction. I repeat, there is an a cappella song about proof by contradiction, and it's actually pretty good. Just, wow. This album is like rule 34 for music — there's a song about everything.

## MATHEMATICS PARADISE

This slow song has a fun and jazzy feel to it with a sick beat that makes you want to snap along. It's a bit philosophical and existential, and questions why  $\pi$  and  $e$  are defined the way they are.

**STEFANIE (THE BALLAD OF GALOIS)**

This song is a beautiful history lesson about the legend of Galois and his love Stefanie. This song is catchy, and features singing with a French accent. It also contains an exchange about the pronunciation of Galois. Is it Gal-oise or Gal-wa?

**MUSICAL FRUITCAKE (PASS IT AROUND)**

This song is where the album gets its name from. It's about being in The Klein Four. Pretty good as a song, but not enough math puns.

**ABANDON SOAP**

This opens with some Gregorian chant and has a really weird ending. In the words of the song: "I have no idea what's going on." This is the only bad song in the album.

In summary, this is the best album ever created. I think the math orientation committee should at least consider having all students learn, by heart, every song in this album (with the exception of *Abandon Soap*) instead of learning the math dance.

Music Expert

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## HUMMUS BANDIT STRIKES FEDERATION HALL

Onlookers were shocked around 7 pm last Sunday evening when a thief made off with a sizeable blob of hummus, taken from Federation Hall. A CEMC event was wrapping up at the time, making it the perfect time for the perpetrators to slip by unnoticed.

The suspect allegedly brandished a plastic bag and managed to pick up 3 spoonfuls before fleeing the scene with an unknown accomplice. The two East Asian males were wearing glasses and a hat respectively to obscure their faces.

The bandit's remarkable commitment to health and reducing food waste has led many to question whether he is a petty thief or actually a true hero of the people. Fed Hall staff recalled that the suspect was very persistent in his desire to take just some hummus. The adjacent bowls of potato chips and cheese puffs were untouched, although they were just as open for the taking. However, the staff maintained that the remaining hummus would not be thrown out, so the Hummus Bandit is actually at fault for his use of single-use disposable plastics.

UW Campus Police do not plan on investigating.

Based on a true story.

water

## UNSUCCESSFUL HACK THE NORTH PARTICIPANT ALREADY HAS BIGGER, LESS PLAUSIBLE IDEA FOR NEXT YEAR

**WATERLOO** — Despite failing to win a prize or place in any sort of challenge at Hack The North, Alton Li was not deterred as he had already decided on an even bigger, more over-ambitious, less plausible idea for next year. Indeed, Li didn't let their experience of spending several hours on one bug, failing to learn new frameworks, and getting less sleep than soldiers on the Eastern Front distract from their grand plans.

Instead of giving up, Alton designed a bold application that would use blockchain to solve some unspecified problem that would be decided later and would hopefully be relevant to blockchain. Also machine learning would happen, as soon as they finished watching that YouTube video about it.

At press time, Li had already selected 12 Javascript frameworks they would use to implement their idea.

UW Unprint

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## I SUSPECT MY NEW ROOMMATE IS A ZOMBIE

I am living in a 5-person suite. Three of my roommates are my good friends whom I know since high school. However, the new roommate who just moved in room No.5 doesn't seem to be an ordinary human being. I suspect she is a zombie.

**Incident 1:** No.2 and No.4 knocked on my door one evening asking if I smelled something extremely disgusting. I got out and as I walked towards bedroom No.5, an indescribable odor almost killed me. It was like something dead was in her room. No garbage has ever emitted such a stench.

**Incident 2:** We found Ziploc bags containing red meat and beans with consecutive dates labelled on it. Who plans for their everyday meals this way?

**Incident 3:** Four of us all agreed we've only heard No.5 getting out of her room at night. We've also heard a man coughing in her room but have never seen any male getting out.

**Incident 4:** She carried home a gigantic box one night.

I already got my axe prepared near the exit. Hopefully I will be alive to write for the next issue.

Autowired

## WHAT I IMAGINE BEING A mathNEWS EDITOR IS LIKE

It is 6:16 in the morning on a chilly September Tuesday. Not an unreasonable time to wake up, if you were one of those try-hard, go-getter morning types. But you aren't. It is 6:16 in the freakin' morning on a chilly September Tuesday and you have been awake for twenty hours. Twenty. Goddamn. Hours.

You tick off what seems like the the thousandth checkbox (although it was probably only the nineteenth if you're being real here). *Editor approved* flashes on the screen. Left-click to close the window. You slam down the lid of your laptop. Bam. Thank fucking god. You're finally done copyediting. Your top eyelids want to crash down with the same ferocity with which you closed your laptop, but you don't let them. You can't let them. There is no repose in the life of a **mathNEWS** editor. But you do it for the sake of **mathNEWS** anyway.

You have an 8:30 lecture and it's not worth it to risk dozing off and oversleeping. Another all-nighter in the name of **mathNEWS**. What have you sacrificed? Has it all been worth it? **mathNEWS** is an unforgiving mistress. But you do it for her sake anyway. Now, you need a coffee or some modafinil. Unfortunately, you used up the last of your stockpile of central nervous system stimulants when you were trying to stay awake for copyediting. Your 8:30 class is in MC, and you decide you'll pick up a coffee or two at the CnD.

When you arrive at the outside doors of the CnD, at 8:02 AM, you smell something very strange. Not quite pungent but not quite pleasant either; it's not a smell you recognize. It's coming from your right. The **BLACK BOX**? A cautionary sniff. Oh yeah, it's definitely coming from the **BLACK BOX**. You peer inside the slit on top of the box and see a whitish form. A piece of paper? It hits you that you forgot to check the **BLACK BOX** yesterday during Production Night. "Oh, fuck," you mutter under your breath. You check your coat and jean pockets for the **BLACK BOX** key, but your little self-frisk is futile. Perhaps you left it in the **mathNEWS** office. You make a mental note to yourself to look for the key while you're doing layouting later that day. Tiredly, you enter the CnD and pour yourself two large cups of the darkest roast they have. When you go to pay, the cashier (they're a new hire, you notice) looks at you sadly.

"Two cups?"

"Yes," you say.

"Is everything alright?"

"Sure."

"All-nighter?"

"Yes."

"What for?"

Why is this person trying to talk to you? All you want to do is chug down your two cups of piping hot black coffee down

your gullet, epidermal burns be damned. You can't hold out much longer — you're beginning to sway back and forth on your own two feet.

"Editing for **mathNEWS**," you reply.

The cashier makes a sound of understanding, and you blink in exhausted surprise. "I know what you need," they say. They take your two cups of coffee and stow them away; from a shelf tucked beneath the cash register, they pull out a small 4 oz glass, filled halfway with an oily, copper-coloured liquid. They take your hand and put the glass in it. "For you."

"I don't understand," you begin. But they quickly shoo you off and soon you are left alone in the CnD with your tumbler of mystery liquid and the boulder-heavy burden of exhaustion from within the pit of your stomach. Your throat pangs with a realization: you are very thirsty. The metallic liquid beckons you with an ever so slightly alkaline scent. You swig it all down in a second (it produces a burning sensation in your throat, but you consider that a problem for later) and throw out the glass into the trash. There's a dull thud and a muffled crash as the cup shatters; strangely energized, you clamber down the stairs to the second floor of MC, ready to attend your CS 245 lecture.

For the next hour and a half, you hear but do not listen to the words of your professor; they gloss over your ears like satin varnish over a painted canvas. You pick out the words *parse trees*, *formulas*, and *truth valuations* among the stream of calm and undulating professorial noises, and you know deep inside that you really should be paying attention for the sake of your academic salvation. Yet all you can concentrate on are your editorial tasks for **mathNEWS**. You can't forget to check the email account to see if anyone submitted more **profQUOTES**. Should you put the orientation-related articles together or spread them out throughout the issue? Will you put the "N Math Proofs to Steal From the Area 51 Raid" listicle before the "What Your Favourite Proof Says About You" listicle, or vice versa? And most pertinently of all — what in the world is in the **BLACK BOX**? Soon enough, you become unable to hear your professor at all, as your senses become completely engulfed by your own stream of consciousness. Your thoughts blaze at a million miles a second, and before you know it, you find yourself in an empty classroom. Its buttery yellow walls are alien. You think to yourself: where am I? This isn't the **mathNEWS** office. Panic nearly sets in, but not before you have a flash of realization and you check your watch for the time. It's 10:21. Your CS 245 lecture ended over half an hour ago. You don't have any more classes today, so you rush back up to the third floor to work on layouting.

You enter the **mathNEWS** office. In your fervent hurry, you push over a three metre tall stack of back issues near the door, which also knocks over five other ceiling-high stacks of issues like dominos. Thousands of issues topple to the floor and soon you are up to your hips in paper in the already tiny and cramped room. Nevertheless, you wade onwards to the office



computer. Layouting must be done today. You'll bug one of the other editors through Slack to clean up your mess later.

As you wait for Adobe Indesign CS5 to start up, you spot a half-eaten slice of zucchini pizza underneath a back issue of **mathNEWS** from 1998 (which must have gotten there when you knocked over the stacks fifteen seconds ago). Lifting up the issue, you also see a glass tumbler — the same glass the CnD cashier gave to you — with about an ounce left of copper-coloured liquid. You gulp down what's left in the glass and start to munch down on the pizza. It's the same pizza that you ordered yesterday during production night. You guess that one of the other editors must have been doing copyediting here last night. Where would they have gotten the drink from though? The CnD is closed at night. Maybe you'll ask some other time.

You get started on layout: applying formatting, inserting **profQUOTES**, wrestling with Indesign, arranging articles, re-arranging articles, vigorously cursing all the while. At some point, you mutter "fuck it" to yourself and throw in some random **BLACK BOXES** throughout the issue to fill up the whitespace. At least this time no one tried to submit an article with LaTeX in it.

You check the time. It's 10:00 PM. You blink in surprise. "10:00?". This was the fastest you've ever completed layout for an issue. You'll definitely have to ask where to get that weird drink from. There's only one thing left to do before you can call it a night, and it is to check the **BLACK BOX** outside the CnD. Looking for the key to the box in the **mathNEWS** office is hard work and it takes an hour of sifting through paper on the floor before you find the key in an envelope marked "CHEQUES ONLY — SPRING '19" underneath a filing cabinet. You trudge your way through the sea of issues and head towards the box. You look down the slit and take a sniff. The same unidentifiable smell remains. You unlock the box and pry open the lid, uncovering its contents.

Inside, there is a thin slice of wrapped Liederkrantz cheese from Vincenzo's, and two sheets of folded paper. You take everything out of the box and walk back towards the **mathNEWS** office. Sitting back down on the office couch, you unwrap the Liederkrantz cheese and nibble on it contentedly as you take out the first sheet: it's solutions to the **gridWORD** from the last issue of **mathNEWS** from last term. You wonder if the submitter is truly dedicated or just clueless. In any case, the **mathNEWS** office is temporarily out of CnD gift cards to give out as **gridWORD** prizes, as you just learned while upturning the entire office over an hour ago.

The second sheet of paper smells of cheap, unpleasantly fruity perfume. It's folded meticulously into a small square, and is taped over. You remove the tape and unfold it and your lap is immediately showered in fine-grained silver glitter. "What the fuck," you hiss. You try to brush it off your pants but it sticks to your hands. This is the worst thing that has happened to you in the last 36 hours you've been awake. Incensed, you're about to storm out of the office when you see that there's a

handwritten note on the inner side of the perfumed paper. You read it:

*You can't have the good without the bad. So you couldn't have the cheese without the glitter. You do it for **mathNEWS**.*

"You do it for **mathNEWS**", you repeat to yourself. "For the sake of **mathNEWS**." You stand up and start wading out the office. "I do it all for **mathNEWS**." You leave MC and head home.

Finchey

*[Editor's note: This is accurate.]*

## WOULD YOU ALL STOP FUCKING COMPLAINING, YOU TRY BUILDING A BUNCH OF GODDAMN BUILDINGS IN BETWEEN THE OTHER ONES

Hello, Waterloo. Yes, I know you're going to ask, "when's the SLC coming?" It's coming, ok? I've learned my lesson telling people due dates for that. It'll be done when its goddamn done, unless you want a fucking pillar falling on you while you're complaining about our food.

Listen, when I came on, no one thought this university would complain its way to the STEM capital of the world or whatever we put on our brochures these days. And since all of you are so goddamn desperate to get that co-op money, we need more room. Unless you want to take a GO Bus to your lectures, we're going to have to mess with a few of the old buildings. So, yes, there will be some minor inconvenience. You will have to go outside instead of travelling from lecture to lecture in a sun-proof containment unit made of textbooks and coffee cups.

If any of you engineers have some amazing way to fit a whole other building on top of an existing one, or any of you science students can open another dimension so we can stop having CS lectures in the Arts Lecture Hall, I would love to fucking hear it.

In the meantime, get used to the construction. It's either that or we start stacking you two to a seat. Probably more human contact than most of you get all year.

Thanks,

**Feridan Hamdullahburger, President**  
(at least for now, you people are fucking exhausting)

## SOME TIPS FOR FIRST-YEARS LIVING IN V1

A lot of first-years live in V1, and for most, there will be some tips and tricks of living there that people will want to know sooner rather than later. Also, please do note that some of these tips are potentially unethical (depending on what your definition of unethical is), potentially against the residence rules, or potentially illegal. I have not checked these tips with any rules, regulations, or laws, so use at your own risk. I am not liable for anything from you following these tips.

It is almost a guarantee that at some point, you will run out of your meal plan dollars, unless you are that one person I encountered last year who somehow managed to have \$600 left in their meal plan at the end of the term. So, it is better to spread the deficit throughout the term, rather than running out your meal plan dollars with about 3 weeks left to go before the end of the term. Here are some tips to avoid that:

- Buy snacks and stuff like cup noodles ahead of time. There will be times when you are hungry and Mudie's is closed. At times like these, you will be thankful that you've stocked up on food ahead of time.
- Speaking of cup noodles, buy an electric kettle if you don't want to have to go to the microwave and back every single time.

- If you don't like how the tap water tastes in Waterloo, like me, buy a cheap Brita filter. It is more worth it than buying bottled water over time.
- Never buy snacks such as chips from Mudie's or the vending machine. The price is never worth the amount you are getting.
- Take advantage of the cashier's habits and psychology to get more of those green carabiners. You can stand near the cashiers when someone else is returning the green containers and sneakily end up with one of your own.
- Don't want to pay for something in the caf? Just steal it. (Don't legit do this though. Good chance you will be caught.)
- If whatever you got from the Carvery is too expensive, pay it by weight instead to save money.
- Never ever buy the small orange juice boxes from Mudie's. Just look at the price yourself. Why would you ever buy that?
- Never buy the instant noodles from Mudie's. You would never want to pay that much for it.

*boldblazer, Epsilon Screwn and ilowns*

## WHAT YOUR FAVOURITE PROOF SAYS ABOUT YOU.

### EUCLID'S PROOF OF INFINITE PRIMES

You enjoy the simple things in life. A warm summer's day, a good cup of coffee, problems ignoring air resistance, but at the end of the day let's face it — you're pretty basic.

### FERMAT'S LAST THEOREM

Okay, it must've been hard to fit your large brain through the door, but good job on getting it done. If you don't understand the proof, but just appreciate its existence, then congrats — you're 100% (rounded to nearest percent) of the population. If you do understand it...let's face it, who knows what the fuck's going on in that.

### EULER'S PROOF OF INFINITE PRIMES

You're edgy. I respect that. You enjoy proving your theorems before your lemmas. If you were told to screw in a light bulb, you would probably construct a new lighting fixture to test if your light bulb worked first, but let's face it — you're pretty extra.

### PYTHAGOREAN THEOREM (GEOMETRY)

Graphics design is your passion. If the whole math thing doesn't work out, you can always fall back on your art. You're probably the type of person to have your own "professional"

metal compass (even though you never actually use it). But in the end, was it really worth using your Wacom tablet to draw all those circle theorems?

### FUNDAMENTAL THEOREM OF ALGEBRA

You probably enjoy having titles like "Senior Vice Assistant Secretary" and, fundamental is no different. You have the power, but you rarely use it for good, if at all. But hey, at least you have your place at the top.

### NOT STATED

Lastly, if you chose a different proof, then go to this website (<http://pirate.shu.edu/~kahlnath/Top100.html>) and CTRL-F for your proof. If you found it, then congrats — you're also basic — and if you didn't, then you probably found it off of YouTube (\*cough\* everybody telling me about Banach-Tarski's paradox \*cough\*), so enjoy flexing it on everybody else.

*Big Data*

# profQUOTES 141.1

## PMATH 351: KEN DAVIDSON

- “ The flight between two cities is not a metric space because it does not satisfy symmetry and certainly not the triangle inequality.
- “ Laurent Marcoux has a set of notes for this course on his website. What he writes in his notes are... [after pondering] correct.

## MATH 235: DAN WOLCZUK

- “ I found out I was teaching this course at 5:00 PM yesterday.
- “ If you don't know MATH 136...learn MATH 136 very quickly.
- “ The key to doing well in MATH 235 is to get all the questions on all the assignments and tests correct.
- “ It should be the case that the course is 100% proofs. We don't do that because, one, we want students to pass.
- “ The course notes are great; the author is awesome!
- “ The guy who wrote the course notes didn't know what he was doing.

## MATH 245: RAHIM MOOSA

- “ That was given because it was kind of cute.
- “ I don't want to construct an example.
- “ One of these might be zero, and it might die.
- “ The whiteboards move, but then they cover up other stuff. I don't see the point.
- “ If  $q=g$  [writes  $q=q$ ] wait, if  $q=h$ ...
- “ So that proves its existence. Oh no! That was case one!

## MATH 237: ROBERT GARBARY

- “ I can prove this to you. I'm sorry if you're afraid of the p-word, but I'm gonna use it.
- “ It's nice to know somebody's listening.
- “ Write whatever makes you happy or less sad.
- “ I'm pretty sure the [lecturer] before me has rage issues and breaks all the chalk.
- “ I brought my own chalk today and the chalk situation is great right now.

## MATH 249: KEVIN PURBHOO

- “ I did say that this was the bullshit part of the class.
- “ All of you are now writers.
- “ I never quite cared about my marks, so I don't quite know why I should care about all of yours.
- “ This class is sometimes a democracy.
- “ I should remind you that waiting until 11:59pm to submit your assignments is a grave strategic error.
- “ I just realized that I took the time to create the lovely chart at the beginning of class, and then I just went and erased it.
- “ I'm not going to explain that question to the rest of you.
- “ Exercise: go home and think.
- “ I'm supposed to take complicated ideas and explain them in a simple way. Today, I'm doing the opposite.
- “ [Student: Is "image" a more complicated way of saying "range"?] No, they have the same number of letters.
- “ Notation is the best part of the course, because I get to say that people are wrong.
- “ The only problem with this claim is that it is wrong.
- “ This will make a lot of people happy, and a few people unhappy until they realize they should be happy.
- “ This is uninteresting because this is the kind of thing I expect you to be able to do.
- “ Sometimes it makes your brain hurt.
- “ We manipulate that hell out of that until we get here...
- “ I have a very strong aversion to writing down a statement which is not correct.
- “ Whether or not you learned partial fractions is one of those highly questionable, suspect things.
- “ I won't tell you what both of them are, but I will tell you what the better one is.
- “ The philosophy remains constant; the examples' complexity increases monotonically.
- “ We represent this usually by a picture... or some other method.

- “ You will see that if you put different numbers into different formulas, you will get different answers.
- “ It can be very fun to try to pronounce these names for about two minutes. Then the novelty wears off and you have to seek other sources of entertainment.
- “ It went from a name to a word for penis.
- “ I will not indulge your petty recriminations of my unequal line lengths.
- “ I should state the theorem before I state the proof.
- “ [writes on board] Step one: we find a recurrence. Step two: we turn it into a series. Step three: profit.
- “ [Student: What's the definition of recurrence?] Something that is defined in terms of... other things.

**STAT 230: DIANA SKRZYDLO**

- “ I've written a bullet point so now I have to fill it. It's like, the law.
- “ Almost all my jokes are not on purpose, by the way. I'm not that smart.

**STAT 230: GREGORY RICE**

- “ I don't know if you have heard of videogames.
- “ I'm the course coordinator, so I can slow us down however much I want.
- “ Kolmogorov is my grandpa. My great-great-great MATH grandpa.
- “ Counting is hard.
- “ I don't get the meme economy at all.
- “ Maybe you're wondering why Mark Twain is up there; I wanted to put up a good Canadian author but I couldn't think of any. That was supposed to be a joke.

**CO 342: PETER NELSON**

- “ The shortest proof is two words: "longest path"

**STAT 240: AUKOSH JAGANNATH**

- “ The probability of "meet" is one minus the probability of "vegetable"...

**ECON 212: JOEL BLIT**

- “ Is anyone from Britain? Ok, I want to talk to you about Brexit....

**CS 241E: ONDŘEJ LHOTÁK**

- “ You... you can chat for another minute.
- “ It should be due on Friday the 13<sup>th</sup>, but that's scary.
- “ We will have a midterm and final. Yeah, okay, lots of courses have those.
- “ Piazza is not Reddit.
- “ One of the greatest joys of computer science are the endless opportunities to make up new words.
- “ The registrar's office is currently looking for chairs.
- “ The registrar's office is still looking for chairs.

**CS 245: ALICE GAO**

- “ Does anyone want to share? This is when you become silent and stop looking at me.
- “ Somehow I proved that a McDonald's cheeseburger is better than eternal happiness.

**CS 246E: BRAD LUSHMAN**

- “ C++ is easy because it is hard.
- “ It just occurred to me now: I should probably give you an assignment soon.
- “ One of the great joys of computer science is the endless opportunity to make up words.
- “ There are two answers. The first answer is usually the wrong one.
- “ [Student gives answer] Okay, who wants to be second?
- “ Let's take a look at dat boi echo
- “ Hopefully you'll get addicted...and not have to worry about anything.
- “ The problem is that zero is notation for the number zero.
- “ It only sees your code after the preprocessor has had its way with it.
- “ This is your industrial-strength comment.
- “ I'm going to sell you a new array.
- “ Usually I'll define a constant and then forget about it.
- “ While we wait for the projector to wake up... which will help if I press the on button, not the off button...

CS 245E: JONATHAN BUSS

“ (After nearly tripping over) Everyone knows how to dial 911 on their phones, right?

CS 245E: STEPH MCINTYRE (ISA)

“ How to do the assignment? First step: read the assignment.

“ You can try it on the weekend, when you're done your assignment. Two hours after you read your assignment.

“ I believe in you!

CS 246: MICHAEL GODFREY

“ There's gonna be dad jokes. I'm sorry.

## ASH KETCHUM, 10, WINS FIRST POKEMON LEAGUE IN 22-YEAR CAREER

**ALOLA** — Kantonian athlete Ash Ketchum has won his first Pokémon League championship title, sources reveal. The 10 year-old Pokémon trainer struggled in multiple other Pokémon League conferences over his 22-year career before finally becoming the first champion of Alola on September 15. Other championship entrants include a grown man, a gang leader, and several other 10 year-olds, all of whom Ash surpassed to claim his title.

Ash's mother, Delia Ketchum, could not be reached directly for comment.

"I'm so proud of him," mimed Mimey, Delia's Mr. Mime, on her behalf. "If you told me 22 years ago that my son would win a championship without aging a day, I would have called you crazy — but look at him! I could swear he even looks younger!"

Overheard after the finals:

"He got me," runner-up Gladion said of Ash's victory over him. "That Ash boomed me."

Gladion added, "He's so good", repeating it four times.

Gladion then said he wanted to add Ash to the list of trainers he works out with this winter.

The new champion was last seen hurrying out of the stadium with his trophy. Eyewitnesses report seeing his hands rapidly shriveling and his hair greying.

## A mathNEWS WRITER'S FASCINATION ABOUT THE ARTICLE COUNT FOR V141I1

It has come to my attention that there are at least 40 other articles in the article storage bin for v141i1 and I am, quite frankly, concerned. There is still approximately 40 minutes until the deadline on **prodNIGHT**, which means if the current growth rate continues we're looking at 57.41 total articles. Subtracting *maaaaaaybe* ~2-3 offensive articles, we come to v141i1 having about 53.7 articles. (Yes, I hope **mathNEWS** publishes 0.7 of an article.) [*Editor's note: We briefly considered letting this be the chosen one.*]

By golly, that is A LOT. Being a pinkie, I have decided to calculate the statistics of v141i1, provided 53.7 articles will be released.

Suppose an article takes an average of a minute to read through (thanks to some articles that are very long and some articles that are very short). That's an hour of reading time! (Technically, 53 minutes 41 seconds, so not really an hour. I'm lying, sue me.)

A sheet of paper weighs about one gram. Suppose a page fits six articles; v141i1 will have approximately eleven sheets (1 for **mastHEAD** and 1 for **gridCOMMENT**). Forcefully interrogating a **mathNEWS** Editor reveals that the entire **mathNEWS** team prints about 750 copies of an issue. This means 8,250 sheets are used in total, or 75.9 pounds of CO<sub>2</sub> released into the atmosphere. Nice. It's still negligible compared to oil companies, however.

An article, on average (using Fermi approximation multiple times), has about 250 words, or 1500 characters. Since there are 256 valid ASCII characters, each character can be represented by a 8-bit value (I wonder why). There are 1500 characters per article, and there are 53.7 articles, meaning there are 80,550 characters. Adding about 3000 from **mastHEAD** and **gridCOMMENT**, we have a grand total of 83,550 characters. This means this very v141i1 article can hold 668400 bits of information, or 83550 bytes, or 83.55 KB (or for hardcore CS people, 81.59 KiB). Not too bad, I would say.

Pikachu Launcher

You know profQUOTES are fake, right?

PROF. DAVID JAO

# GRATITUDE

## WHAT IS GRATITUDE?

Google says, “Gratitude, thankfulness, or gratefulness, from the Latin word *gratus* ‘pleasing, thankful’, is a feeling of appreciation felt by and/or similar positive response shown by the recipient of kindness, gifts, help, favors, or other types of generosity, towards the giver of such gifts.”

In layman's terms: “Gratitude is an emotion expressing appreciation for what one has—as opposed to, for instance, a consumer-driven emphasis on what one wants or thinks they need.”

## BENEFITS OF GRATITUDE

In positive psychology research, gratitude is strongly and consistently associated with greater happiness. Gratitude helps people feel more positive emotions, relish good experiences, improve their health, deal with adversity, and build strong relationships.

## WHY BOTHER?

Maybe because the alternative is pessimism and pessimism can often turn into a self-fulfilling prophecy. Most humans in the 21<sup>st</sup> century tend to be pessimistic because they see it all around them — you check your phone after waking up in the morning, and the first thing you see is a Facebook rant on how unfortunate life is, or yet another “Why I left BuzzFeed?” video.

When we see such things, our mindset tends to wire itself to think in such ways. In other words, we see what we look for. When things do not go the way we want them to, we often feel disappointed and tend to blame others. This tendency to externalize blame can often work against you. Rather than thinking what someone else conspired to bring your downfall, think what you can do to avoid such pitfalls in the future. As one Waterloo alumni spoke regarding failure:

*“The cost of failure is a lesson. The lesson is repeated until it is learned.”*

## WAYS TO INCORPORATE GRATITUDE INTO YOUR LIFE

1. **Keep a gratitude journal.** As Ryan Holiday (my favorite author) said in many of his writings, start your day by journaling. You might say, “you expect me to find time before my 8:30 class to fucking write?” I thought exactly the same when I first read up on this, but it can be very simple and rewarding. After waking up, simply write down one thing you are grateful for.
2. **Thank someone mentally.** No time to write? It may help to just think of how someone has helped you or made your day better.

3. **Visualize.** This may sound a bit extreme, but imagine someone you deeply love dying. This practice is very disturbing and rightfully so. It is designed to help you feel grateful for that individual's presence in your life. If you want to take this to the next level, call them up, tell them what they mean to you, and that you love them. This will make both your days much better.
4. **Start slow.** One habit that has personally helped me is not checking social media for the first hour after waking up. I feel this gives me time to wake up naturally, rather than being bombarded by notifications about other people's lives which don't impact me in any way. This also feeds into the first point about journaling; rather than starting your day by checking social media, you could spend that time on yourself.

If you are still reading this, I hope I have been able to provide you with at least one idea to cultivate gratitude in your life. This was my first article for **mathNEWS**; hopefully they'll progressively get better. See you in two weeks.

*Hopeless optimist*

Sources:

1. <https://www.health.harvard.edu/mind-and-mood/in-praise-of-gratitude>
2. <https://www.psychologytoday.com/ca/basics/gratitude>
3. <https://ryanholiday.net/the-most-important-thing-you-can-do-each-morning/>

# THE MASCOTS

You may have already had encounters with the faculty mascots (including our beloved Pinkie the Tie <3) and King Warrior, the university mascot. Now I love the mascots and all, but they kinda look out of place, you know? With all the geese that are on campus, I think it's time for us to respect our true overlords and change the mascots to something that truly represents us. Here's what I'm proposing:

- **Math:** a goose wearing a pink tie
- **Science:** a goose wearing a lab coat and safety goggles
- **Arts:** a goose wearing sunglasses
- **AHS:** a goose holding a Frisbee
- **Environment:** a goose wearing a "banandana"
- **Engineering:** 4 geese wearing hard hats with 2 of them chained to the tool
- **Main mascot:** a big goose (mother goose) holding a sword and wearing a helmet

honk

# THE SIGNS OF DATING

Forget height or potential annual income, astrology is the new cool and totally legit way to determine whether or not someone is Dating Material™. When you finally work up the courage to ask the cutie working at Turnkey what their name is, don't forget to ask for their star sign too and look here to see if they're the one for you.

## ARIES

Thinks fighting creates sexual tension. Wants you only if they think you're unavailable. Dating is a "game" to them and they're addicted to it. Gets bored of you after date 3. Will cheat on you.

## TAURUS

Actually thinks they own you. Wants to do absolutely everything with you and thinks you don't love them anymore if you don't. Craves commitment but will never ask for it themselves and will never put in work for it either.

## GEMINI

Will never know what they want. Flaky as hell and will be constantly in and out of your life. Thinks communication is them rambling on and you not speaking and just listening. Will cheat on you and then somehow make it your fault.

## CANCER

Only attracted to you if you have emotional baggage. Will hold you back on purpose because they can't live without you. Lowkey manipulative. Will cheat on you but say you pushed them to do it.

## LEO

Has the worst egos. Control freaks. Will never love you as much as they love themselves. Thinks dating them is a once in a lifetime opportunity and that you should worship at their feet meanwhile they bring absolutely nothing to the relationship themselves.

## VIRGO

Nothing is ever enough for them. Passive-aggressive. Shallow and will hold all your flaws against you. Thinks bullying you is a form of flirting. Cares about you but won't tell you. Will take forever to let down their guard and is never worth it.

## LIBRA

Don't bother LMAO. Will cheat on you.

## SCORPIO

Will put you through 87 trials and mental games to prove that you are "worthy enough" to be with them and then doesn't date you anyways because your vibes are off. Needs to be psychologically tortured for them to love you back.

## SAGITTARIUS

Not meant for relationships I am so sorry. Narcissistic and can never admit to their own faults. Honest to a fault and will hurt your feelings unknowingly but gets mad as hell when you tell the truth to them cause they're childish. Corny. Will cheat on you.

## CAPRICORN

Thinks that being an engineering major is a personality trait. Will never stop complaining. Tricks you into being interested in them when they're actually the most boring mf on the planet. Lowkey though....kinda sexy. Not worth it.

## AQUARIUS

Will ruin your life. Thinks ghosting is a perfectly reasonable way to break up with you. Heartless. Thinks they're Jules from Euphoria when they're really Kurt from Glee. If you're seeing an Aquarius you still single. Does not respond to texts. Will cheat on you.

## PISCES

Will never forget anything you've ever done. Will set your trash cans on fire if you ever cross them and then pretend to be innocent afterwards. Delusional. Cucks. A headache waiting to happen. Honestly... they do love you. Their demands will age you 6 years.

*professional astrologer and NOT the head  
of Math, Colin Phipps PhD*

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## BABY FORMULA FLAVOURED JUUL PODS

2003-2005 roll call!

I'm (13F) looking for a baby formula juul pod flavour hookup, transaction will be discreet. I crave the chalkiness. please email [mathnews@gmail.com](mailto:mathnews@gmail.com) if you have some to spare.

*once again, not Colin Phipps*

# WATERLOO MATH: ONE YEAR LATER

Ah, Waterloo. Math.

One year ago, I was in first year. Bright hopes, full of dreams, didn't have a clue what I was doing, but boy was I glad to be in a place where I could find out. Well, I'm happy to report that only one of those things has changed, and, best of all, it was the thing I was the most worried about. Against all odds, let's talk about the good things that can happen to someone in a year — because I did actually stay here for three straight terms — and why, at least for me, it's still super interesting to wake up in the mornings and seize the day.

Before that, though, let's get one thing straight. This article is mostly meant for those who haven't already been here. For those of you who have, you may find this article a bit stuffy, or perhaps overly optimistic, unrealistic, useless, bla blah blaha. Too bad. I'm publishing this article, so there are hundreds of printed copies of it all over the place, and there's nothing you can do about it.

That said, let's talk about what I learned, and what you can learn from me.

1. **Figure out what you're here to do.** This is probably the most useful thing I have to say, which is why it gets to be first. As a student in university, you probably don't have a lot of free time. Even if you do, you're probably still using it to do work. Because of that, I would put an immediate and significant priority on figuring out what you're here to do at Waterloo. Now, I don't mean that you should figure out what majors/minors to take immediately, what lifestyle you want to have, which jobs you should be going for — instead, set a more abstract goal, like figuring out where you fit in, or finding what it is that you enjoy doing. When I came here, I didn't have a clue. All I knew was that I liked math. But a year later, I've found a love for CS, a decidedly great interest in being a silly individual, and a lot of great friends. Be yourself — but decide what 'yourself' really is, and decide what that self wants to be. You can make it happen here, you just have to keep it in front of you.
2. **Talk to the person next to you.** I know. It's hard. Especially if they're a girl. But as someone who's made a lot of friends in only three short terms, your best asset as a human is your intelligence. So use it. Show it. Tell it. Hell, climb QNC and shout it out as loudly as you can. You'll make friends doing it, I guarantee it. And once you have, lean on those friends as hard as you inhumanly can, because they will be capable of so much more than just you — and just capable enough to turn in this week's 135 assignment. I'm sorry, maybe you are a genius. But even then, where's the fun in not 20 intelligence if you don't get to show it off? Networking is important too, I'd bet that's the only reason some

of you are even here. A word of warning, however: some of you may be frightened, or awestruck, or feeling outmatched by those around you. That is fine. Remember that you don't see them worrying, you don't see their fears, and you don't know what they don't have, that you most assuredly do. Oh, and if you meet someone super smart, go make friends with them. Believe me, they could probably use it. And so could you.

3. **Set a standard.** Sweet freedom. Sweet Dreams. Life at university is intoxicating, quite possibly in a good way, but great care can and should be taken so as to not fall over the edge, which is in fact right between your feet. Good standards are the usual thing. Hours of sleep. Dollars per week. Meals per day (in both directions). Classes attended. I personally set super high standards in all avenues, and did well for it. But I'm aware that that doesn't work. Don't worry, it doesn't have to. Even if you break your own standards, and you will, you're stronger for setting them. That is part of the point, after all. Just don't forget what you're here to do.
4. **Relax.** Obviously, there will always be those of you who go loopy in the other direction. Crazy 140s people who crunch out 3 side projects a month (and get that same number of hours of sleep that month), who are somehow capable of taking 6 courses a term with 95+ marks in each, and who are human. Well, nothing I can do or say will get you to change, so just know that I'm impressed. Really impressed, keep doing you because you're going to do great things. Just make sure that you don't burn down a fuse that's shorter than you think just because you can.

Now for some smaller things...

5. Talk to your profs when you get the chance. They'll help you a lot.
6. Talk to your parents when you get the chance. They will listen, and importantly, you'll want to talk about what you're doing.
7. Yell really loudly when you're frustrated.
8. Try not to sweat the small stuff.
9. Do however much you feel you need to, and hopefully a bit more.
10. Go to campus events. You won't regret it.
11. Find a good place to study as early as you can. You'll need it.
12. Next week won't be less busy than this week, I'm sorry to tell you. That shouldn't stop you from getting over it, though.
13. Never forget that you already made it this far. Good work.
14. Never forget how much you have to learn. That's uni for you.



15. Never forget that the most important thing you need for success here is passion. If you have that, you can overcome ridiculous difficulties.
16. Never forget what you're here to do.
17. Think about what you want for Christmas.
18. Be greedy. Ambitious. Demanding. It worked for me.
19. Keep your room clean, it's easier to concentrate.
20. Drink coffee when you want, it's good for you.
21. **mathNEWS** has free pizza every other Monday.
22. You can never have too many friends.
23. You CAN get too much sleep, but it's pretty hard.
24. Linux is really good for programming, but not too much else.
25. Macs are good for putting stickers on them, but not too much else.
26. If you're doing a lot of math, please learn how to use LaTeX. It will scratch all the right aesthetic itches.
27. Get good headphones and listen to video game music when you study.
28. If you have a Linux machine, learn Vim because it's really cool.
29. If you're in CS, learn VSCode because it's really cool.
30. Get a good water bottle, we are Waterloo for a reason. (The water sucks, but stay hydrated.)
31. [REDACTED]
32. Get good boots, next term will be rough.
33. Get a good jacket, next term WILL be rough.
34. Get a good backpack. Why don't you have one already?
35. Get a laptop case, or you will regret it.
36. Get a phone with a good camera, because you can submit a surprisingly large amount of homework with it.
37. Use bookmarks on your computer all the time.
38. Turn off those stupid Piazza email notifications, I've left them on for full terms and they're completely useless.
39. Everyone has Facebook, get it even if it's just for Messenger.
40. Apply to Starterhacks, it'll be fun.
41. Go to the gym, exercise is good for studying and not feeling bad.
42. Finally, learn to cook. It'll be useful for when you don't have a meal plan anymore.

There are doubtless hundreds more tips that anyone could give you, but the pink is in your hands now. Eat, sleep, math and repeat.

The42ndRhombidodecahedron

## RUNNING AWAY FROM YOUR PROBLEMS

"Kowalski! Options?" "A strategic retreat?" "Explain." "It's like running away, but manlier."

Sure, I might have had a few problems, and what was my response? Moving 4 hours away to Kingston and changing schools. Was it easy? Hell no. Was it a guaranteed fix? Also no. BUT, it was a step in the right direction.

So, you're here. Waterloo. It's big, and scary, and you already have to think about midterms after your first two weeks. Even for upper year students, projects are already looming overhead. However, you're getting used to it. Knowing where your classes are, talking to a few people in each of your classes, all that. You know it won't be a walk in the park, but you put your best foot forward and get to work on everything. However, if the weights start to get too high, you have to keep one important thing in mind.

You're not doomed to fail. You've got options.

Ask your classmates. Ask your profs. Ask TAs. Attend the math help sessions even (~~those are still a thing right?~~). It's not high school anymore, so nobody cares if you don't understand everything the moment it reaches your ears.

If that's still too overwhelming, remember that A) summer classes exist and B) nobody's forcing you to get your degree in exactly 4 years. You don't HAVE to stay in a class that you know you're going to fail. You can drop and re-take it next

term, or over the summer, or even overload a term down the line if that's what it takes. You'll feel it in yourself when you know you can't pass a class, take that from a guy who got 0% on a calculus quiz. The school isn't going to make things a cakewalk for you, but you don't have to sit there and take it.

And, there's something else you can keep in mind too. That's not the limit of your control. It's confusing, but with the right help you have it completely in your powers to leave the school if it means a betterment for your mental health. From a former deserter, I know it feels like you're "losing" in some way by moving schools, but I can promise you that if you choose to then there's nobody judging you for leaving UW. (Except maybe UW. But what are they gonna do, send the goose-stapo after me?)

As a former Warrior, I hold Waterloo dear to my heart, mostly because of **mathNEWS**. However, sometimes the grass can actually stay greener on the side of the fence you move to. And now, as a Queen's Gael, I'm actually a bit more comfortable with how I'm handling my school.

Not to worry, however, as I hold my shitposts much too near and dear to my heart to give them up anytime soon, so I shall be e-commuting my shitposts instead.

Best of luck to everyone, and I hope you heed my advice well.

Fruitboy@Queens

## DJAO'S OFFICE HOURS: A NARRATIVE

It's a Tuesday — the month doesn't really matter — and a cloudy Tuesday at that. You're in your first term, and you just got out of a MATH 145 lecture with the fabled David Jao, who will henceforth be referred to as Djao. The assignment is due tomorrow, and you just can't quite figure out the last proof for the life of you. Your professors had always said to take advantage of office hours, and so you figure you should try your luck at Djao's office hours. You remember him saying his office was in MC 5032, but word around campus said MC 5032 was just a storage closet.

Having made your way to the fifth floor of MC, you see the room number fashioning a glimmer down the corridor — 5032. As you get closer, you see it reads "David Jao" underneath. Although scholars debate the existence of this office, it stands here before you. The door is already open, and inside, Djao sits at a small desk, working on a countably infinite number of proofs, or quantum cryptography or something. I don't know, you fill in the details. You quietly step in and wait, so as to not disturb him.

Djao doesn't address you — he doesn't even put his head up to acknowledge you. Just as you're about to pipe up and ask your question, he stops you in your tracks. "You should think about it harder," he remarks, still looking at his computer. As your throat motions to speak again, he beats you to it once more. He looks up and the door shuts behind you. Panic sets in. You go for the door, but he uses fcitx to type some ASCII ■ characters into existence to block the doorknob. Although he hasn't gotten out of his chair, he seems closer than before. A low mutter enters your ears. "Think about it harder," it echoes. You feel a stick of chalk in your hand that you don't recall picking up. A spotlight illuminates the blackboard as the rest of the lights dim. "You know the answer; write it on the board," he says. You don't actually know the answer — that's why you came here — so you use the chalk to hopelessly write some quantifiers and letters at random, hoping to look smart. You start talking some nonsense involving non-commutative rings, because that's what smart math people talk about or something. Djao puts a hand on his forehead disapprovingly and complains about your logic (or lack thereof). He asserts that it's not a proof if it's not rigorous. You agree. Your shame can be modelled by an exponential growth curve. With each attempt at asking a question, Djao's demands for you to think about it harder get more intense. Sometimes, for fun, he lets you get a question out, just to tell you to think about it more in response. Whatever you were going to ask doesn't matter anymore, you're just thinking super hard. You look at clock and the hands are moving counterclockwise. Djao knows you can do it, but you know you can't. Djao gives his trademark smirk. You're thinking about it so hard that the chalk starts to disintegrate in your hand from the heat being given off by your head. You black out (medical professionals refer to this bodily ailment as a "big think").

You wake up outside MC 5032. It's just a storage closet, and the door is closed. It's past office hours now. There's a scorch mark on the ground under your head.

The proof comes to you.

jeff

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## INSECURITIES DON'T HOLD UP TO PEER REVIEW STUDY

This past weekend, a university student had insecurities about how people disliked them. None of these beliefs actually had any compelling evidence to support them. The evidence for them was as flimsy as the evidence for vaccines being bad. We wish that we didn't actually have to clarify this, but it is not a point of contention among people who are actually experts on the subject that vaccines *don't* cause autism and *are* vital tools for public health. The student, when presented evidence that there was no basis for feeling sorry for themselves, responded by making a meme on r/2me4meirl. They say that this person is still browsing social media feeling sorry for themselves due to the long wait times for counselling services and the fact that they didn't actually read the paper as it wasn't presented as a meme.

Beyond Meta

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## QUICK PICKS

This week's news headlines, fresh from **mathNEWS's** world news headquarters in New York:

- Man Desperately Searches for Second Personality Trait After Favourite TV Show Cancelled
- As WaterlooWorks Opens, Feridun Desperately Tries To Avoid Being Matched to University of Waterloo For Eighth Time
- Justin Trudeau Officially Begins Election Campaign, Canadians Prepare To Increase Not Paying Attention Levels To Maximum
- Supreme Court Justice Ruth Bader Ginsburg Reads, Understands, Legally Analyzes Every Word Of Lease, Still Can't Recover Key Deposit
- SLC Construction Firm Sheepishly Admits They Thought They Were Working For RBC This Whole Time

UW Unprint

# PERPLEXING PIAZZA POSTS

**NOTE @28 09 /15 /19**

[Instr] **Weekly Advice**

It doesn't matter what I type here because no one's reading this anyway.

I fucking love cats.

**Followup Discussion**

Interchanging the 2<sup>nd</sup> and 3<sup>rd</sup> words in that sentence is proof that English syntax is not associative.

**QUESTION @18 09 /10 /19**

**A1 Q1**

does the "|" symbol mean the abs sign or the integer divisibility sign? there's only one of them so does that mean a half absolute value of the number?

**Student's Answer**

It's a 1.

~ *An instructor thinks the poster is a dumbass.* ~

**QUESTION @12 09 /08 /19**

**I'll take a medium cheese pizza.**

I want dairy free cheese, pineapple, thin crusts, also can you cut it in a pentagram shape? it's for a friend I promise. also hold the cheese.

**Student's Answer**

This is piazza.

**Teacher's Answer**

Pineapple on pizza eaters are heretics.

**QUESTION @10 09 /08 /19**

**½=1.5 but ⅓ is not????**

please help I've been struggling with this for 4 hours.

**Student's Answer**

That's because ⅓ is equivalent to ⅔ and ½ is not.

~ *An instructor thinks this is a good answer* ~

**Teacher's Answer**

Don't worry. This was hard for me to grasp when I was at your stage, and it still is for me now.

**QUESTION @3 08/31 /19**

**A Clarification Would Be Sufficient**

On page 386 of *The Vocabulary and Brain Words of Advanced Algebraic Geometry 15<sup>th</sup> Edition*, I am confused about the geometrical orthogonal derivative of the conical logarithm function which is equal to the third root of the convergent obtuse Fourier Banach...

**Student's Answer**

This class hasn't even started.

**Teacher's Answer**

This course requires the **13<sup>th</sup> edition**, not the 15<sup>th</sup>. Don't feel bad that you don't understand this concept, not everyone is meant to be smart.

**QUESTION @2 08 /31 /19**

**Anyone else think the professor should adopt me**

I'm serious. The predatory housing company I was with last term did NOTHING about the ant problem. I got the bright idea of starting an undercover fried ant restaurant but they reported me to the health inspectors? Really? Like no one even got hurt except one undocumented fatality, but it doesn't even count because it's UNDOCUMENTED. I know this should go on r/uwaterloo but they banned me for atespeech? What the actual fuck I don't even eat peaches I'm allergic!

**Student's Answer**

I don't know what policy 71 is but this is against it.

**Instructor's Answer**

Here's an exercise: if I already have n kids that I don't want, prove that I don't want n+1.

# A RECURRENCE IS SOMETHING DEFINED IN TERMS OF OTHER THINGS

We were in MATH 249, our intro to combinatorics class, and just learned about a way to use the binomial theorem and partial-fraction decomposition to solve recurrence relations.

For instance, you can take the Fibonacci sequence and define a power series whose coefficients are the series; that is,

$$S(x) = \sum_{n=0}^{\infty} f_n x^n$$

and then note that

$$S(x) + xS(x) - x^2S(x) = x$$

and then solve for  $S(x)$ , decompose the result into partial fractions, apply the binomial theorem, and then pull out individual coefficients of the resulting series and you have the closed-form equation for the Fibonacci sequence. (These steps have been omitted because they're not as aesthetically pleasing.)

We were all stunned with how complicated it looked and then slowly, slowly our horror turned to awe as we realized how powerful the technique was and back to horror as we realized how painful the technique was anyways.

Then a student asked, "What's the definition of a recurrence?"

And our prof, caught off-guard, answered, "Something that is defined... in terms of... other... things."

That got a hard round of laughter. Part of it was the flub; part of it was that we should know what a recurrence was anyway; and part of it was that it that flub was, for the most part, correct.

Because a recurrence, though often said colloquially to be something defined in terms of itself, is *not* defined in terms of itself. Commonly what we call recurrences are sequences of numbers defined recursively (or inductively) over some base case; each of those numbers is defined in terms of some "lesser" number. More formally, we say that they're defined "recursively:" each in terms of something similar, but "smaller". Not one of them is defined in terms of itself, and no group of them are defined cyclically in terms of each other.

The third Fibonacci number is defined in terms of the first and second Fibonacci number. The first and second Fibonacci number are defined in terms of the natural numbers.

The natural numbers, themselves, are a recurrence. The Peano axioms of arithmetic define zero and then every other number as the successor of its predecessor; set theory defines zero as the empty set and then every other number as the union

of its predecessor with the set of its predecessor. Those are recurrences; they're defined recursively.

What *aren't* recurrences? Things like rings, groups, fields, and all of their derivatives come to mind. Those certainly aren't recurrences. But aren't their definitions also in terms of other things? Aren't *all* definitions in terms of other things?

They aren't just defined by other things. A ring is a set paired with operations plus and times that satisfies seven axioms. And those axioms do nothing but define the set and operations in terms of each other. The set can be defined first since only its size really matters anyway, but addition and multiplication have to be defined together because of how they interact.

Oh, and the axioms don't state it, but the set actually does have restrictions (one, that is) because of what addition demands.

Then again, you *could* consider these number systems a recurrence, though just somewhat finite, since algebras are built on vector spaces which are built on fields which are built on rings which are built on groups.

If we start to include equivalences in our definition of recurrence, then the prime numbers are a recurrence (the least number not a multiple of all smaller prime numbers), the odd numbers are a recurrence, any algorithm is a recurrence (by the steps in it), the strings of any alphabet are a recurrence, any alphabet is a recurrence (a symbol distinct from all previous symbols), and eventually everything in math is a recurrence.

Except for the fundamental object, like the empty set if you're working under set theory. And at that point, we'd need to get meta to keep going.

And though maybe an interesting investigation, it's a pretty unsatisfying answer.

At this point, we should probably go back to the beginning and see if we should reformulate something at the root.

For one, why should *some thing* be able to be called a recurrence? Most of what we colloquially call recurrences are entire sequences, so let's include that aspect: a *set* of things may be a recurrence.

Similarly, we'd probably think of linked-lists as "structurally similar" to a recurrence, but binary trees not so. If the tree can be "flattened" into a linked-list, then the two represent the same set, on which the recurrence may be defined. This is reminiscent of a well-order, so let's include that aspect: a set of things may be a recurrence over a well-order.

The base case of a recurrence tends to be defined in terms of something outside the recurrence, and the other elements also, in some way, in terms of that "something outside," so let's include that aspect: a set may be a recurrence over a well-order and set of foundations.

And finally, usually if there's a simpler, shorter way to express an equivalent definition, then we'd define it that way and not call it a recurrence. This depends on the language you're working over, though; if you're a set theorist, you'll probably disagree with someone working in analysis about the "simplest" way to define something. So let's include that aspect.

And this is what we end up with:

A set  $S$  of is a recurrence over a well-order  $<$ , set of foundations  $F$ , and language  $L$  if there is a definition  $\delta$  which specifies element  $v_i \in S$  using only the objects in  $F \cup \{v_j : j < i\}$  and this definition  $\delta$  is the minimal definition of all definitions of  $S$  in  $L$  using only objects in  $F \cup S$ .

And maybe that's a bit more satisfying of a definition.

dawdling

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## ANDREW SCHEER AND ORGIES: AN ANALOGY FOR THE CPC'S POLICY ON BUILDING PIPELINES THROUGH FIRST NATIONS TERRITORY

Let's say I want to organize an orgy. Orgies can be fun if everyone involved is a willing participant, but they are not fun if someone is forced into it. I need 5 people for it to be an orgy, so I invite 5 people, but only 3 say yes and the other two say no.

Because a majority of the people I invited said yes, it is okay to force those who said no to come to the orgy? After all, why should the 2 people who said no get to overrule the 3 who said yes? I can't have an orgy without 5 people.

I think it's very clear why I can't force the two people who said no to come to my orgy. People are individuals, not a monolithic group. Everyone has the right to control what happens to themselves.

Political Expert

## TALKING ABOUT AFRICA

Hey,

Next time you want to refer to something happening in Africa, try to at least know what country the event of interest is happening in.

Africa is not a country, or a monolith, so please act like it...

Binyavanga Wainaina's essay [How To Write About Africa](#) is a great piece of satire if you're also frustrated by encountering anti-blackness and anti-indigeneity when trying to learn about cool science stuff from a university based in a white supremacist state #StolenLand. #ColonialismSucks.

The Tired African

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## N MATH PROOFS TO STEAL FROM THE AREA 51 RAID

- Proof of the Riemann Hypothesis
- Collatz Conjecture
- General Solution to the Navier-Stokes Equations
- $P = NP$  where  $P \neq 0$  and  $N \neq 1$
- The Proof of Fermat's Last Theorem that's actually in a margin

boldblazer

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## PROPOSAL TO SOLVE THE STUDENT HOUSING CRISIS OF SEPTEMBER 2019

Let's lock up the landlords and acquire the buildings through eminent domain. WUSA can take control of the buildings and house students, finally answering the question: "What does WUSA do for me, and why should I pay my student fees?"

Housing Policy Expert

**mathNEWS is the best thing that's ever happened to me.**

A \$100% SINCERE mathNEWS EDITOR

# N MATH ORIENTATION TEAM NAMES THAT DIDN'T MAKE THE CUT

- Team L'Hôpitalligators
- Team Crocodileta
- Team Discrimin-ants
- Team Account-ants
- Team Accountanteaters
- Team Aardvarktan
- Team  $\pi$ kas
- Team Scorpions
- Team Scvpions
- Team  $\pi$ thons
- Team Pythons
- Team Javaguar
- Team C Shark
- Team Dr. PaRacket
- Team Lamb-da
- Team Hippogriff Statements
- Team Elsephants
- Team Stringfish
- Team Char
- Team Boolions
- Team Booleanacondas
- Team Anaconda Science
- Team Anaconda-Don't-Want- $\emptyset$
- Team Viperpendicular
- Team Perpendik-dikular
- Team Periodik-dik Functions
- Team Perpenduckular
- Team Perioduck Functions
- Team Canareas
- Team Cartesian Crane
- Team Parabolakeets
- Team Pink Flaminimumgoes
- Team Puffintegration
- Team Quaildratic Formula
- Team Albatross Product
- Team Equailtion
- Team Woodpeckernel
- Team Falcongruence
- Team  $E\mu$
- Team  $\tau$ cans
- Team Swallowest Common Denominator
- Team Cocka2
- Team Pea-series-cocks
- Team Condorthagonals
- Team Boarthagonals
- Team Chimpanzeroes
- Team Prime-apes
- Team  $\sqrt{}$ rangutans
- Team Porcupline Segment
- Team Opossumation Notation
- Team Pigma Notation
- Team Affoximations
- Team Jackalculus
- Team Intigers
- Team Pantheorem
- Team Chee $\theta$
- Team Ocelot Product
- Team Antislopes
- Team Doemain and Range
- Team Algezebraic Equation
- Team Formule-as
- Team Permuletation
- Team Giraffe-Theory
- Team Kangaroots
- Team Hippopotmus
- Team  $\tau$ rantulus
- Team Cockpch
- Team Dogic
- Team Cockernel Spaniel
- Team Flamute
- Team Dogarithm
- Team Sonic the Hedgehogarithm
- Team Echidnatural Numbers
- Team Frogic
- Team Vectortoise Space
- Team Coeelfficients
- Team Coefffishients
- Team  $\beta$  Fish
- Team Puffermat Fish
- Team Axisolotl
- Team Axiomolotl
- Team Giant Isopodulus
- Team Crabsolute Value
- Team Penguinfinity
- Team Indolphinity
- Team Riemannatee Sum
- Team Eusquid
- Team Octoplus
- Team Platyplus
- Team Sealing Brackets
- Team For Wallaby
- Team Hare-exists
- Team Bear-exists
- Team Polar Bear Coordinates
- Team Cubinatorics and Optimization
- Team Financial Analysis and Walrus-k Analysis
- Team Yaktorial Science
- Team Math/SealPA
- Team Math/CP-seriesA
- Team Math/CPApes
- Team CFMpalas
- Team Math/BeeBeeA
- Team Math/BBApes

(I can't take credit for all of these)

Deriving for Dick

# N THINGS OVERHEARD AT prodNIGHT

- “Don’t do it unless you’re insane, which you probably are.”
- “I mean I guess it’s hard but at least people aren’t that oversensitive”
- “So when we say a page... (points at a napkin) ... That’s the size we want.”
- “I’ll probably write an article about the thousand various ways to do drugs.”
- A: “I’d argue that  $0/0$  is a complex number, and that fact is useful in some situations.”  
B: “So  $0/0$  is 5?!”
- “Listen, if you just want to use the secret ‘get out of jail free card’ for ANYTHING, that option is up to you.”
- “Some people draw 8 as two circles!”
- “Is this a Monty Python sketch? This is great.”
- A: “At least three people are needed for an orgy.”  
B: “No, at least 6 is necessary for an orgy.”  
A: “(Shows wikipedia) See, it’s 3.”  
B: “What are you, a sex-ologist?!”  
C: “But 2 is multiple people. I can’t have sex with one person.”  
D: “There’s only one source available: Canadian laws.”  
E: “The Canadian definition of orgy makes no fucking sense! What the fuck is this?!”
- “I don’t want to read an article about boring birthday parties!!”
- A: “There’s only two orientation articles, I’m sad...”  
B: “What about mine?”  
A: “I said two.”
- “Is it okay if I have absolutely nothing informative to write an article about?”
- A: “It’s 8 PM!”  
B: “It’s 8 PM?”  
C: “It’s 7:43...”  
A: “I’m rounding up.”
- “Christians always get whatever they want; after all, is there any reasons why we don’t have exams on Sundays?”
- “I wish people would fight again. Y’know, with their hands.”
- “It’s called COQ because there exists a French programming language whose pronunciation sounds like penis in French, and the program language creator intentionally named it COQ as a reference to this.”
- “We must make a pact, Germany MUST be destroyed. Britain and other countries must surround Germany and annihilate it, and blame Britain after everything is over.”
- “Why would I go to a WUSA meeting?!” (said by a current undergraduate at-large senator, former FEDS WUSA councillor, and FORMER Mathsoc prez)

Pikachu Launcher

# CALC DESTROYERS

hi guys, mmmmm, look at these lovely big taylor polynomials do you know what we are? we’re fucking calc destroyers aren’t we babe?

calc fucking destroyers.

yeah fucking calc destroyers. we love to just get your  $dx/dy$  and fucking derive them fucking topological balls. mmm.

d’you know what, rub these fucking topological balls in our mouths...

yeah look at that,

...and then fucking triple integrate  $f(u)$ .

hehehheheheh

fucking Riemann sums everywhere

differential bitches

Deriving for Dick

# N PROOFS THAT $0 > 1$

1. Imagine having 0 fires vs having 1 fire. In your house. Since you would rather have no fires in your house for reasons only pure math majors can comprehend,  $0 > 1$ . ■
2. Let  $a = 1$  and  $b = 0$ . Since the ASCII code for  $b$  is 98 and ASCII code for  $a$  is 97,  $b > a$ ; henceforth,  $0 > 1$ . #
10. Solar radiation allows a bit flip turning 0 into 8. Using this fact, and pushing the buttons on my calculators at the right time, I can show that  $0 - 1 = 7$  which means  $0 > 1$ . If you can successfully pull this maneuver, you will become a math god that can prove the impossible.
11. A **mathNEWS** Editor suggested this as an article topic which must mean it is true. QED
12. Let  $0 = 2$ . Since  $2 > 1$ ,  $0 > 1$ .
20. Give up being creative and accept that 0 may never be greater than 1.
21. Those who follow 20) are pussies; the hunt for the true proof of  $0 > 1$  will always go on.

Pikachu Launcher

## HOW MUCH IS 9%, ANYWAY? A GUIDE TO NOT DOING ASSIGNMENTS

Before you strategically leave your next assignment un-submitted, consider the following:

1. **Do you need to pass the assignments to pass the course?** If so, wait until at least mid-November before you do this to yourself.
2. **Is this course in your MAV?** If so, briefly consider the impact missing this assignment will have on your MAV before going ahead to Question 3 anyway.
3. **Do you enjoy this course?** If not, harness your pure spite to power through your course so you'll never have to take it again.
4. **Do you have other things to do?** If so, do them and come back to this assignment in a day or two, telling yourself you're definitely not procrastinating by doing so. If not, wait a day or two anyway. You've still got a week! You've still got... five days. Three days. It's due tomorrow. How did this happen?
5. **How much is it worth?** 1% is an skip, 9% less so. And yet here I am, wondering if I should skip this whole programming portion of this security assignment anyway. It's, uh, *only* 9%! Right? ...Maybe I'll just go to office hours.

AC

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## DON'T HOOKUP WHERE YOU V-LOOKUP

### CONS:

1. You can't avoid them at work.
2. It'll get REALLY awks when you breakup.
3. It's awks for everyone around you.

### PROS:

1. Everyone else will have teaaa.

Alice Wang

## A 1A STUDENT'S GUIDE TO ICLICKERS

Every new 1A student (including me) was recently pushed into quite the experience that is UWaterloo. But before we even have had a chance to experience this hell in its full glory, UWaterloo has done that for us with a mandatory purchase: the iClicker.

So, what is an iClicker?

An iClicker is, frankly, a demon sent by UofT to disrupt UWaterloo. This fact becomes apparent from the very moment you are introduced to it: you have to pay \$40ish. And as we all know, money is the root of all evil. This means an iClicker is worth about 1600 evils, which I must admit is quite evil.

But it only gets worse from here.

Your classes require the presence of these very demons — and what do you know, your life (grades) depends on (5%! This should be unacceptable) them. Your professors, being complicit in Satan's scheme, takes this one step further and force you to touch these iClickers to test your understanding. Usually this results as a demonstration that you clearly don't know things and make you feel bad for hurting your gigantic ego. I have done a statistical test ( $n = 1$ ) on this sensitive topic and came to the statistically significant conclusion that people are dissatisfied with these iClickers and are looking for an alternative.

So what am I suggesting? I say we grab all of these iClickers and push them into Alabama, **mathNEWS'** recently acquired territory. This way, we will be able to populate an unexplored territory and make **mathNEWS** stronger. But what about the replacement, you ask? For obvious reasons, it is suggested that the replacement for ego-destroyers within classrooms be a Nobel prize winner in every class, as they at least encourage somewhat fair competition.

It should be noted that a side effect to this scheme is that the 5% participation grade is no longer obtainable; however, since everyone's grades dropped by 5%, all employers will notice this trend and end up hiring the Nobel prize winners as usual.

Pikachu Launcher

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## GREETINGS!

Hi!

I love the new SLC.

*not Donald Trump*



## MY REVIEW SO FAR OF BREXIT SEASON 4

The previous three seasons of Brexit were all action-packed, suspenseful, and full of cliffhangers to keep everyone watching at home on their toes. However, I think Season 4 has been, so far, the best season yet.

I think it was a bold move for the series to change the main character. It really moved the story away from the same old plot lines and Theresa's old catchphrases. It seems to be working, as the hype continues from when they announced the new guy. The main rival Jeremy still remains, but it seems the producers are trying something new here. They are really focusing on the character development of the Liberal Democrats, who used to be one the lesser rival characters of the series. They're trying to make them into a sort of a rival of a rival, but still a rival of the protagonist, which is an ambitious move.

Although, one big thing I found weirdly missing from the main story is the Brexit Party. Last season, they became *the* main rival to the main character, but there is no mention of them at all now. Where did they go? Back in the European Parliament elections they were the biggest party by far, but now they completely disappeared from the plot. I think that the producers are trying to shift the focus to the Conservative party to try to make them more intimidating, which seems like fanservice to me.

Also, remember when the series was supposed to be finished back in Season 3? Everyone was so hyped up for the finale, but then a week before that episode was supposed to air, they announce Season 4. Hopefully they don't do one of those "Game of Thrones" tricks and try to prolong the entire thing for another season. Mark my words. Watch as the viewership of Season 4 drop suddenly, if they do announce a Season 5 after all.

Still, the drama in the season makes it so much more worthwhile than the first two. I love all the mind games and all the strategies the characters employ against each other. It's so crazy complicated that every episode you end up thinking, "I would have never thought to do something like that!" The complexity is at the level of the Doctor Who series. Who would have thought to use the Northern Ireland Bill for the purposes of Brexit, other than the script writers? The pace is also stronger; the previous seasons were all slow and full of filler episodes. Although the hiatus that happened in Season 2 because of the argument that the production crew got into was definitely a reason why the season was so bad, so it's understandable that the pacing has improved now. Now the episodes go by much quicker, although I guess they have no choice but to be fast — I hear they will be forced into having a break in a couple weeks.

Overall, despite the shortcomings, Season 4 of Brexit may turn out to be one of the best season yet. Let's hope they don't disappoint us by making the finale a let down, or worse,

try and prolong the series on life support by extending the series to a Season 5.

The finale of Brexit Season 4 will air on Thursday, October 31<sup>st</sup>.

**boldblazer**

## N TITLES OF MY BREXIT RELATED ARTICLES THAT BECAME OUTDATED BEFORE BEING SUBMITTED TO MATHNEWS

- Will Boris Johnson Lose His Majority in the House?
- There's the Independent Group for Change, the Independents, and Just Independent MPs. How Many More Independents Can There Be?
- When the Party Whip Don't Matter As Much Anymore
- Brexit Bingo
- N Reasons Why Brexit is Basically Like University
- N Conservative MPs Who Might Quit the Conservative Party Because of Boris Johnson

**boldblazer**

### ISSN 0705-0410

UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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# HANK'S HOME IMPROVEMENT WAREHOUSE

Dusk was finally upon the warm summer evening, and while the temperature lowered and families gathered in their backyards to enjoy the last rays of sunlight, the employees at Hank's scurried to tidy up before the end of day. Hank's was a home improvement warehouse, a particularly popular one in the area, and was always a little out of order after the customers had moved things around.

"Whatya doin Chris? Clean ya section up before boss comes around. Otherwise my ass is gunna be on line for your shit!"

"If ya so damned worried about *my* section why don't ya clean it yourself you stupid prick?"

"Ah go fuck yourself Chris, always a hassle with ya ain't it? I got shit to do in electrical, so pick ya lazy ass up and go fix the barbeque covers. Otherwise I'm gunna call Larry to come over here himself!"

Chris grumbled as he slowly leaned off the front counter. Who did this fucker think he was? Ten years on the job, always putting in a hard day's work. Then this little prick comes around and Larry promotes him to manager. "Fuckin' kiss ass, ten years of no one bustin' my balls and now I got this little shit telling me what to do. He don't even know how things *really* work around here anyways."

After Chris stayed in the barbeque section a few minutes, he strolled back to the counter. He didn't want to waste any more effort cleaning the store, it was bound to get dirty again anyways. After about 30 mins of idle staring, he decided to head home early. There was no point sticking around til the end if there wasn't anything for him to do.

—

"Ah shiieet, if I woulda known you was workin today I woulda called in sick!"

"Haha, how's it going Andre? I've been bored out of my fuckin' mind without you here. What time you working?"

"The classic man, ten to fo. They never give me full shifts anymore but fuck it if I care, I get to sleep in and still party at night."

"Haha, fuckin' right man. Hey by the way, you seen Marisa lately? She's lookin' like a real dime today. Whatya say we head over there now, I needa break anyways."

Chris and Andre slowly strolled towards the light section, one of the few places in the store with a predominant team of females. In contrast to Chris and Andre's section, it was spotless and extremely well organized. The duo gazed upon the two female employees, Marisa and Christine, as they helped an elderly couple find a lighting fixture for their front porch.

"Man she IS lookin juicy today. If I could have one night with that gurl I promise you..." Andre's head tilted back as he contemplated all the things he would do to Marisa.

"Fuck eh, she gotta nice pair on her too. Man, why do we work all the way in barbeque when all the pussy is right here?"

"Shiieeet! I know man, but fuck it, let's start heading back. Larry is probably gunna head over soon and I hate when that lil shit gets on my case."

Chris and Andre started to stroll back to their designated area, dodging customers who need help along the way. Andre was busy telling Chris about a new job opportunity at his uncle's work, LTD Landscaping.

"The pay's better! We'd be outside and not cramped inside this shithole. And apparently there's this fine gurl Tenisha that my uncle keeps telling me about. It's a great opportunity man, so whatya say? My uncle can put in a good word for you too."

Chris gave Andre a blank stare.

"Uhh, I don't know man. A new job, that means I gotta learn a bunch of new shit. And fuck, as much as I hate this place, I got seniority. People respect me here and if I start at this new job people are gunna treat me like dog shit. It's stupid, but fuck that's the way life is. Ya man, thanks for the offer, but I'm good."

"Alright man, no worries. I just thought you wanted out of this shit job as much as I did, but it's coo."

"Hey, don't be acting like you're big shit cus you gotta new job. A job your only getting cus of your uncle, mind you. I'm out here tryna make it on my own, GRINDING day in and day out. So don't be looking down on me buddy."

"Woah, chill man, I ain't even got that job yet. And I wasn't tryna fuck wit chu or anything, I was just tryna help you out."

"Yeah whateva man. Imma go clean the barbeque section cus I KNOW no one else will."

Andre exhaled and smirked, shaking his head. The two of them finished their shift in silence. Ten minutes before closing, Chris packed his things and left.

"Who did Andre think he was, tryna force him to leave Hank's. It was a shithole but fuck, if he was gunna be kicked out, it surely wouldn't be by that asshole Andre. Naw, they'd have to drag me outta here, and before that I would have socked Larry in the face. Yeah that's right, hah, I woulda showed that fucker who's boss, hah. Yeah, that's how'd I'd leave this garbage job."

# ORIENTATION TEAMS RANKED BY A MOD-GOOSE

*Author's note: This article is extremely biased and should not reflect the opinions of other MODs who didn't show up to production night.*

12. **mx + bees:** The least memorable team considering we couldn't name it off the top of our heads. Didn't cause a buzz.
11. **Rho-noceros:** Placed last. Memorable leaders, but unmemorable throughout the week. What do rhinos do?
10. **Frogorithms:** Didn't respond to their fucking radio apparently. Props to the shading work on their flag. Didn't hop to it.
9. **Parallelican:** Flew through orientation, but didn't soar. Their progress was parallel to the x-axis.
8. **Epsilon:** Roaring cheer! However, they were part-Laurier students and it showed, especially when they didn't show. Score was greater than zero, but pretty low.
7. **Owl-gebra:** Placed high-middle, but low energy at the final ceremony. Absent at the rap-battle. It's not that their cheer wasn't memorable, it just wasn't a hoot.
6. **Infiniguana:** Thought they were slick with their Kahoot names. Placed third, but I can't seem to remember how? Pretty flag maybe?
5. **Baboolean:** Personally my favorite leaders. Arguably the best team name as demonstrated by the controversial reaction when choosing it. Oh yeah, they did the best at SLR. Truly a small team that couldn't rack up enough points.
4.  **$\pi$ -ranhas:** Cute cheer. Strong run in the rap battle event even with only one member to represent the team. Well-rounded team, but they didn't go for blood.
3. **Ine-koala-ties:** Eucalyptus! Best cheer because of its corresponding choreography. Sadly, they were four points behind Team Infiniguana so they couldn't make the podium.
2. **Integralephant:** The winners of Math Orientation 2019. Leaders were rewarded appropriately. Their exceptional cheer was as educational as it was fun. They fall short with their basic flag and their French Revolution tactics during the Nerf War.
1. **Orangu (sin/cos):** Won the cheer-off and received ties from the Dean himself. Undeniably turned it out at the rap-battle. They didn't win the trophy, but in my heart they won the week.

I'm a Mod, I don't cheer!



# IMPORTANT PROOF TO PUBLISH

*SUBMITTED BY A REAL MATH PHD WHO IS STUDYING NON-COMMUTATIVE RINGS OR SOMETHING LIKE THAT*

**Theorem 1** (Euler's Identity).

*Proof.*

$$\begin{aligned}
 e^{i\pi} &= e^{\sqrt{-\pi}} \\
 &= e^{-\sqrt{\pi}} \\
 &= \left(\frac{1}{e}\right)^{\sqrt{\pi}} \\
 &= \left(\frac{1}{3}\right)^{\sqrt{\pi}} && \text{Since } e \approx 3 \text{ and } \pi \approx 3 \\
 &= \left(\frac{1}{-}\right)^{\sqrt{1}} \\
 &= (-) \cdot \sqrt{1} \\
 &= -1 \implies e^{i\pi} = -1
 \end{aligned}$$

□

jeff

# MY BUCKET LIST

Have you ever grown up wishing you did more things in your life? Well, it is never too late to start! You can start your own adventure by making your own bucket list. Here's a background story to my sad little lonely life.

From having to stay inside my room as I couldn't ask for permission to go out and play cards with friends, my parents being asleep, to not being able to go on a senior trip with said friends, there were moments where I wish I could have done more, to have been more bold, to have taken that next step. (Or mainly cause I have strict parents :))

So today, instead of looking back on the sad moments, I'll be making a list of what I want to do in the future — hopefully, this will inspire you to start your own adventure bucket list.

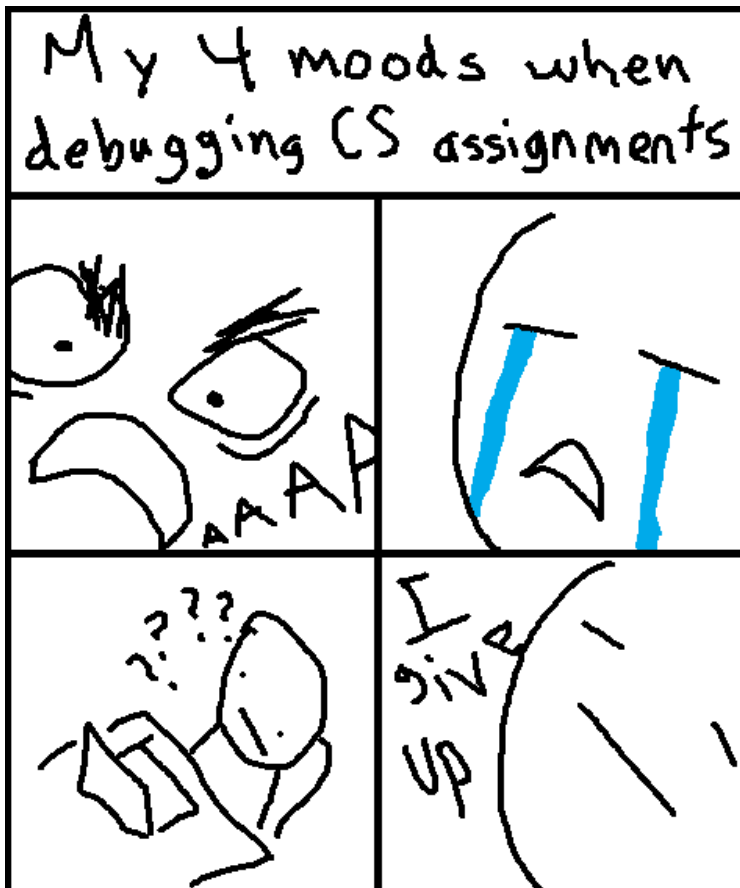
1. Ride a Ferris wheel (this may be a sad thing to start with, but you gotta start somewhere; might as well start small).
2. Travel to another country with friends.
3. Go on a hot air balloon ride.
4. Go camping in the woods (yes, I want to go camping even though I hate bugs and the outdoors).
5. Bake a cake. (I have never baked before, so why not?)
6. Visit some of the wonders of the world (Great Wall of China, pyramids, etc.).
7. Bungee jump off a bridge.
8. Graduate university.
9. Learn a new instrument.
10. Pet a kangaroo (I gotta find a 10<sup>th</sup> item to finish off this list).

This list may have been boring for you, but hopefully it'll inspire you to start your own list. NOTHING IS TOO SMALL OR TOO BIG! Take whatever step you want in life, conquer whatever fear you have.

JUST KNOW THAT WHATEVER HAPPENS EVERYTHING WILL WORK OUT! WOOOOOOO!

#welcome to Waterloo (gotta stay optimistic somehow :))

team owlgebra member



# gridCOMMENT

## gridCOMMENT 141.1

Hello everyone; it is September, and yet again I find myself upon this iron throne of crossword-making as new students filter their way through these hallowed halls here, starry-eyed and replete with ardent energy while all the jaded upper-year students mosey from their nooks and crannies against the din of enthusiasm. Never fear, for **mathNEWS** is here, and with it the obligatory **gridWORD** that comes with basically every issue.

For those who are joining us for the first time (and those who just wish to have a refresher), the **gridWORD** is a feature column of this illustrious publication where the **gridMASTER** spend in a little over two hours' time clobbering together a crossword for everyone to enjoy in exchange for the Editors buying me pizza (which you can get in on if you write for the publication). To motivate solving of this crossword, the Editors graciously have provided a prize (usually a gift card, but not always) to the most correct solver submitted before a deadline. To enter, simply do the following:

1. Solve the grid as well as you can and include it in your submission. Don't be afraid of not doing very well; I think we've had an issue where someone didn't submit a grid and won by virtue of being the only person to submit anything.

2. Include your name (so we know who you are when you come pick up the prize), and optionally a moniker to be credited under when the winners are announced in the following issue.
3. Include your answer to the issue's **gridQUESTION**, of which whomever provides my favourite answer to is the tiebreaker in the event of a tie for most correct.
4. Submit before the deadline (for this issue, 6:00PM on September 30<sup>th</sup>, 2019) either physically to the **BLACK BOX** mounted on the wall next to the neon "Math Coffee + Donut" sign in the 3<sup>rd</sup> floor hallway of MC or electronically to [mathnews@gmail.com](mailto:mathnews@gmail.com)

Group submissions are welcome, but you will need to duke it out amongst your group members to determine who actually gets to keep the prize.

This issue's **gridQUESTION** is "If you were stranded on a deserted island for a week and you could bring one thing, what would it be and why?"

Happy solving,

ZETHAR,  
gridMASTER Eternal

### ACROSS

1. A nutria
6. The area by University with shops
11. Drunkard
14. Canada meets three of these
15. Ticked off
16. Season opener?
17. Not meant to be
19. Usually found next to Home? (abbr.)
20. Syrian city in the news
21. "Phooey!"
22. Sportsman
25. Marbles, so to speak
27. Lentil dish
28. Expand on 12D?
31. Rock/Blues duo, with Hall
33. Soybean paste
34. My message to our first-years (3)
40. Kiln
41. Basic data structure
43. Relinquish
48. 100%
49. Trap
50. Sows again
52. Baltic capital
53. Keen
55. Form of "to be"
56. Playful mischief
61. Cyst
62. Sit in on
63. Steakhouse selection
64. Tennis call
65. Second-most popular official language of South Africa
66. Adding sound effects after shooting

### DOWN

1. Sin counterpart?
2. The next month, for short
3. Assent
4. They do not meet (at least on the plane)
5. Prince Harry, to Louis
6. Thrust
7. Language that Racket is based off
8. Additionally
9. Last, in the US
10. Sum
11. Apparition
12. Busy
13. Cross
18. Biological net
21. Kind of test
22. "Much \_\_\_ About Nothing"
23. Sign of spring
24. Abhor
25. Comme ci comme ça
26. Fragrance
29. Change a motion
30. (Usually) represented as a 0 or 1
32. Mark up
35. Walkie-talkie word
36. Blokes
37. Split chord
38. In alignment
39. Difficult
42. Concurrence
43. Bonne \_\_\_ (a la fin du jour)
44. Pressing
45. Counterpart to 21D
46. Corrections
47. This pulls a bit
49. Infant locomotion

51. Quick smell
53. Start over
54. Cuckoos
56. Part of a jazz combo
57. "Come again?"
58. Without exception
59. Formerly, in introductions
60. Pen

1	2	3	4	5	6	7	8	9	10	11	12	13
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64					65				66			

# LOOKAHEAD

SUN SEPT 22	MON SEPT 23	TUE SEPT 24	WED SEPT 25	THU SEPT 26	FRI SEPT 27	SAT SEPT 28
	Last day to opt out of Health and Dental insurance	Tuition and fee refund deadline — 100% Last day to drop a class without penalty	Drop with WD begins	Course selection period begins	Adjust online course examination location period begins Final examination schedules released	

SUN SEPT 29	MON SEPT 30	TUE OCT 1	WED OCT 2	THU OCT 3	FRI OCT 4	SAT OCT 5
	mathNEWS 141.2 production night (free pizza!)	International Coffee Day		National Boyfriend Day		
	mathNEWS 141.2 published Requests for religious accommodations due					

## MATHSOC SEZ

Greetings Marvelous Mathies,

Welcome to one of the largest faculties on the UWaterloo campus! I hope you're all enjoying the first month of classes, and believe me, if you've made this far, then you all will do great.

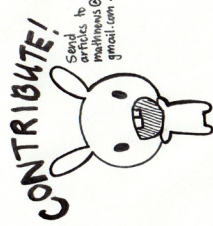
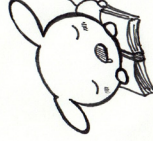
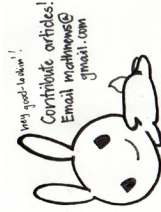
We had a great and busy start to this term, with lots of new faces coming into the office full of energy to get involved and volunteer, and I thank them from the bottom of my heart. We are planning to have a lot of cool events this term, starting with "Board Games Night" every Thursday till the end of term. We are also in the process of organizing a joint Semi-Formal in November between us and another well-known student society (which I'm sure most of you are aware of, so guessing their name will be something I'll leave to your imaginations).

We have free candies every day (Monday-Friday, 9am-5pm) for you and your friends, so do swing by to have a quick chat with me or our lovely office

workers, who will be happy to help with you any of your concerns.

Hope you all have a great and successful term, and once again welcome to the "Math Family".

Regards,  
Rajat Malhotra  
MathSoc President, Fall 2019



otherNEWS is made technically possible by club executives of the Math Faculty. I say "technically" because if they had sent us more news this week, this box wouldn't be here.

THE mathNEWS EDITOR WHO PUTS THE "NEWS" IN mathNEWS