



THERE IS BEAUTY (AND π) IN THE CHAOS.
YOU JUST HAVE TO LOOK FOR IT...

“WHO'S BACKSTABBING YOU THIS IDES OF MARCH?”

Good $\{TIME_OF_DAY\}$, dearest **mathNEWS** reader! It's hard to believe that the apocalypse began only a year ago. Approximately this time last year, I would have still been living in my first-year residence in VI, coming back from a lovely day of C and matrices and integrals. Little did I know, that my world would soon be flipped upside down, tossed and turned, covered with cheese and chicken and—oh, no, wait, that was just my VI cafeteria omelette. God, no wonder I picked up weight in first year.

Anyway, the point is, the world has changed drastically since the last time we were on campus—or at least some of us, since statistically speaking there is a non-zero chance that you're actually a first year, in which case you either have never been on campus or currently *are* on campus, depending on whether or not you took the in-person first year MATH courses.

Anyway, as I was saying, the past year has been a wild ride for all of us—well, not strictly speaking *wild* since there has been a distinct lack of parties and undomesticated animals, and not strictly speaking *ride* since we weren't allowed to go outside our homes for the best part of the year... you know what, I should really stop over-analyzing the words I use, because most, if not all, of my vernacular comes from the *Before Times*, so it's natural that some contradictions will arise in the context of the past year.

Anyway, what I was going for was the fact that it's been almost a year since the stay-at-home regime started—which, ironically enough, forced me to stay *away* from home, since being an interational student I was always afraid that Canada would shut off entry and I'd be stuck in my home country while university went on without me. That actually never ended up happening; I guess the proportion of international students in Waterloo is simply too large for that. Oh well.

Anyway, the reason I brought this up was that on the occasion of us having spent an year in relative isolation—though honestly as someone who doesn't talk to people much anyway, I don't think my level of isolation was really any different...

Anyway, the reason for this whole charade is that I just saw that our template has options for four distinct levels of emphasis and I wanted an excuse to use all of them. Cheers!

caffeinatED
Editor, **mathNEWS**

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WALDO@<3.LE-GASP.CA	Every job application ever. (Someone hire all the mathNEWS contributors plz)
A COOL PEN NAME	Wait it's fucking March already?
TENDSTOFORTYTWO	My second hand laptop dealer
GIRAFARIG	After some research I've established that I do not have a back
DERIVING FOR DICK	Idk who but they gotta stab me in the Brutussy
ROYAL NO.69 MILK TEA	I'm stabbing the person below
IRON GODDESS IS BETTER	I was stabbed by the person above
FINCHEY	My acupuncturist.
CLOAK AND VORPAL DAGGER	Not sure yet. Where's the fun in being stabbed if you see it coming?
SARS-CoV-2	Those damn vaccines, ruining my spread through the human population!
APHF	Anyone who wants to, man. I am not that picky.
CC	“Then fall, Caesar” is an underrated part of the quote, change my mind
ME	Not sure about backstabbing but I'm certainly being frontstabbed by life.
BOLDBLAZER	If the precedent set by Julius Caesar is of any indication, it would seem as though it would end up being my friends and colleagues.
QUANTUM GOOSE	Stabbing is a relative term.
H5N8	I will avenge you Corona Sensei. They won't see me coming.
PSYCHGIRL	My housemate, Hooty
NOGENDER,ONLYHOOTY	My doppelganger that lives in reflective surfaces.
CLARIFIED	Myself.
GOD ⚡ PEED	Dunno who does it, but there better be a civil war about it later.

ARTICLE OF THE ISSUE

This issue was filled with long, quality works, and the choice for article of the issue was close as ever. However, after many months of careful research, planning, and under-the-hood stability improvements, we have decided to bestow this great honor to One Year Since March 13th, 2020 by royal no.69 milk tea. Congratulations! The feels from this one were incredible, highly recommend flipping over the proverbial pages to check it out. Or, y'know, click the link. Since everything is online.

Time marches on. Before you know it, it's March time.

NAMAN SOOD, **mathNEWS** EDITOR FOR WINTER 2021
ALONG WITH KEVIN TRIEU AND CLARA XI

mathASKS 145.4

FEATURING PROFESSOR ONDŘEJ LHOTÁK

BOLDBLAZER: TO START OFF, HOW WAS YOUR DAY?

Not bad, not bad. Some days get busy and I feel like I'm falling behind and will never catch up, but since I'm writing this, it must mean I have some time. It's been a nice day to get outside for a bit, which I find essential especially in winter and especially during lockdown.

TENDSTOFORTYTWO: WHY ARE FUNCTIONAL LANGUAGES THE BEST LANGUAGES?

Modular reasoning. One can look at a small piece of code and understand what it does without worrying that somewhere in the other million lines of code, something is invalidating the invariant one is depending on. And a compiler or automatic verifier can understand it too. But they need to be typed functional languages. Types document and enforce the behaviour we expect of the rest of the program. Types lose a lot of their effectiveness outside of functional languages, which may explain why they are underappreciated in general. It's also a reason to use functional languages, to get the full benefit of types.

ABALD MAN: WHY ARE OBJECT-ORIENTED LANGUAGES THE BEST LANGUAGES?

They enable many people to write a lot of useful software. Sure, it's frivolous to give popularity as a reason, but if programming language designers want to help programmers, we need to give them tools that work with the code they have, not only the code we wish they had.

There is sometimes violent disagreement on what the term "object-oriented" even means, and many of the supposedly defining characteristics of OO also appear in other paradigms, but the one concept that decidedly is OO and is often underappreciated in other paradigms is subtype polymorphism. The ideas of sets and their subsets are foundational in mathematics and frequently relevant in practical situations. Some languages avoid subtyping because it makes type inference challenging, but I think it's worth the trade-off, so this is something that OO gets right.

TENDSTOFORTYTWO: I LOVED YOUR CS 241E OFFERING LAST TERM! WHERE CAN I GET MORE OF THIS?

In CS 241E, we make use of some powerful and interesting theory, and I'm sometimes sad that there isn't time in the course for more theoretical work. For the theory of automata, grammars, and languages, there are CS 360/365 and CS 462, which were among my favourite courses during my own undergrad. Then there is CS 442, which is supposed to be a programming language theory course, but it does have plenty of implementation as well, so in some ways it's the closest thing to CS 241E. Definitely take that if you liked CS 241E. For building compilers for a larger, more realistic language, there is of course CS 444.

CIX: WHAT IS SOMETHING YOU TRIED REALLY HARD TO LIKE BUT JUST COULDN'T?

Once upon a time, I was as interested in hardware as I am in software. I was going to study Computer Engineering, and changed my mind to Computer Science with only minutes to spare before the deadline for my decision. I wanted to take the Electrical Engineering Electives, a larger precursor to today's Digital Hardware Specialization. To do so, I had to meet with Byron Weber Becker, who told me that many students drop out of it, so he'll only let me in if I convince him that I'm very serious about it, which I was. I was fascinated by the material in the first course, ECE 100: the course notes had I think a thousand pages and I couldn't put them down; I read them cover to cover before the course even started. The course, on the other hand, was terrible, an embodiment of competitiveness and negativity, not only among the students but especially perpetuated by the instructor. The emphasis was on demotivation and on ranking students, leaving little time or space for the fascinating material. So after that course I had another meeting with Byron to switch out. The rest of my electives were mostly in modern languages and I enjoyed them a lot.

TLLLOW PRINCESS: WHERE'S YOUR FAVORITE TOILET ON CAMPUS?

You're just trying to get me to see a positive side to the campus closure, aren't you?

CC: IF YOU COULD HAVE ANY ROOM AT UW AS YOUR OFFICE, WHAT WOULD YOU CHOOSE?

I do have some secret hideouts around campus where nobody would expect to find me, where I occasionally go when I really need to concentrate, usually when writing something difficult.

My office is not bad. It's pretty quiet and not too far from my lab but not too close. The view out the window could definitely be much worse, though I suppose it could also be better.

CLARIFIED: WHAT WERE SOME OF THE HIGHLIGHTS OF YOUR UNDERGRADUATE EXPERIENCE AT UW?

I still think of my undergrad as one of the best times of my life. There were so many interesting new things to learn and relative freedom to do so without worrying much about the future. My impression of the atmosphere, at least within my social group, was that people were happy to learn and to help each other learn. I'm unhappy when I hear about the competitiveness and stress among undergraduates today and I hope that some of that atmosphere inconspicuously remains. There are so many amazing opportunities in mathematics and computer science that there is more than enough to go around for everybody.

ABALD MAN: WHAT IS YOUR FAVOURITE PROOF?

It's debatable whether it's technically a proof, and perhaps it's cliché in programming languages, but I'll still say the Curry-Howard isomorphism, because it brings mathematics and computer science together. Maybe that's overstating it a bit, but it does say that proving theorems and writing programs are fundamentally the same, which is comforting for someone who likes both. I like the rigour that it brings to understanding what proofs and programs really are and how it transfers insights from one to the other.

TENDSTOFORTYTWO: I'VE BEEN WANTING TO COME TO THE ACM COMPETITIONS BUT NOT SURE IF I HAVE THE RIGHT SKILLS FOR IT. WHAT WOULD YOU SUGGEST AS SOME GOOD PREPARATORY METHODS FOR A CONTEST?

The best way to get started is to come out to one of the local contests that we run once a term. People of all backgrounds and abilities show up, and we always try to have at least one problem accessible to beginners. It's easier and more fun to get started in an event like this with other people than trying to learn on your own. There's also free pizza. See <http://uwaterloo.ca/icpc> for details or to sign up on a mailing list where we announce the local contest dates.

There are several online sites with thousands of past problems, where you can submit solutions and have them tested like on Marmoset. That provides a virtually unlimited supply of practice problems if you have the time and motivation to do them. There are also some books, not too many but a few, covering the most common algorithms and implementation techniques. They are not hard to find with an online search, but I can also provide some pointers by e-mail.

QUANTUM GOOSE: WHAT IS YOUR FAVOURITE FEATURE OF SCALA? WHAT IS YOUR LEAST FAVOURITE FEATURE OF SCALA?

I know that the cake pattern is not considered cool anymore, but the more general idea of modular component abstractions that motivated it¹ is as relevant as ever, even though we now have additional features to implement them with. More concretely, I like that you can write down an algorithm at such a high level that we would call it pseudocode, then plug in some details and it runs, while the overall algorithm remains clearly visible, separate from the details. You can focus on the problem that you are trying to solve separately from implementation details. OO languages have interfaces, ML-derived languages have modules, but neither achieves the clarity that is enabled by Scala's dependent types.

Least favourite? sbt.

1. Martin Odersky, Matthias Zenger: Scalable component abstractions. OOPSLA 2005: 41–57

QUANTUM GOOSE: WHAT ARE YOU MOST EXCITED ABOUT IN SCALA 3? WHAT ARE YOU LEAST EXCITED ABOUT?

Scala 2 had at its core some simple but very powerful features. Over time, creative people found clever ways to build things out of those features that nobody would have imagined when the features themselves were first introduced.

I'm sure Scala 3 will be the same. There are small but powerful concepts at its core, and we won't know all the crazy and amazing things you can do with them until people have had a few years to play around. Three features in particular that have a potential for unexpected applications are context functions and contextual abstractions, the new metaprogramming system, and the type-level programming features.

VIM ONLY: WHAT ARE YOUR THOUGHTS ON INTELLIJ IDEA? DEFEND YOUR OPINION IN 100 WORDS OR LESS.

I learned Watcom Vi in my first co-op work term, then vim, and since then I've never been able to put up with anything else. IntelliJ IDEA was the first IDE that I'm willing to use instead of vim, so that's quite an achievement.

The Language Server Protocol will be a game changer for editor and IDE choice. Before, each IDE had a big piece of a compiler embedded. To get the functionality of that compiler, you had to give up your editor and put up with whatever editor and UI was built into that specific IDE. LSP decouples the compiler from the IDE or editor. It saves IDE writers from having to rewrite half a compiler and it gives users the freedom to choose from a variety of editors and IDEs to control their compiler.

BOLDBLAZER: YOU ARE SUDDENLY GRANTED THE POWER TO DECLARE THAT AN UNPROVEN CONJECTURE/HYPOTHESIS/ ETC IS FALSE. WHAT CHOICE WOULD CAUSE IMMEASURABLE DISAPPOINTMENT AND CAUSE PEOPLE'S DAYS TO BE RUINED?

This is a nice question but I don't have a good answer because computer science is often good at circumventing theoretical results. For example, Rice's Theorem says that static program analysis is hopeless, but we do it all the time anyways. Boolean Satisfiability is NP-hard, but SAT solvers solve large instances amazingly fast.

WALDO@<3.LE-GASP.CA: WHERE DO YOU SEE THE FUTURE OF CS RESEARCH AND COMPUTING IN GENERAL HEADING TO?

It will continue to grow. Computer science is still a young field with a lot of room to grow, and it has a big impact on people and society, so there are incentives for it to grow. There will be hot areas of course, but there will still be demand for continued progress outside those hot areas. If you find an area you like, it doesn't matter that other areas are more popular.

profQUOTES 145.4

MATH 146: ROSS WILLARD

- “ The zero vector will have to be the apple because it's the only vector in this stupid vector space.
- “ Wait! Let's make this set even more finite.
- “ Luckily, you're not Western students.
- “ Now it's time to *blow your minds*.
- “ Could it be?? You're darn tootin' it is!

MATH 148: STEPHEN NEW

- “ This class is not for education of the masses; this class is for education of the masochists.
- “ *Snaps fingers* *waits 2 seconds* *snaps fingers again a little to the left* Find the angle between those two points.

CS 146: BRAD LUSHMAN

- “ C is an acronym for cute.
- “ The fact that this doesn't crash is actually quite surprising.
- “ The designers of C were trying to be cute but ended up confusing people.
- “ It wouldn't be Racket unless there's a lie or two along the way.
- “ If your coworkers are doing this, get different coworkers; that's just bad citizenship.
- “ If you try to do mutation in Haskell, I would say Haskell will yell at you but yelling at you is a side effect.

REES 230: PAUL MALONE

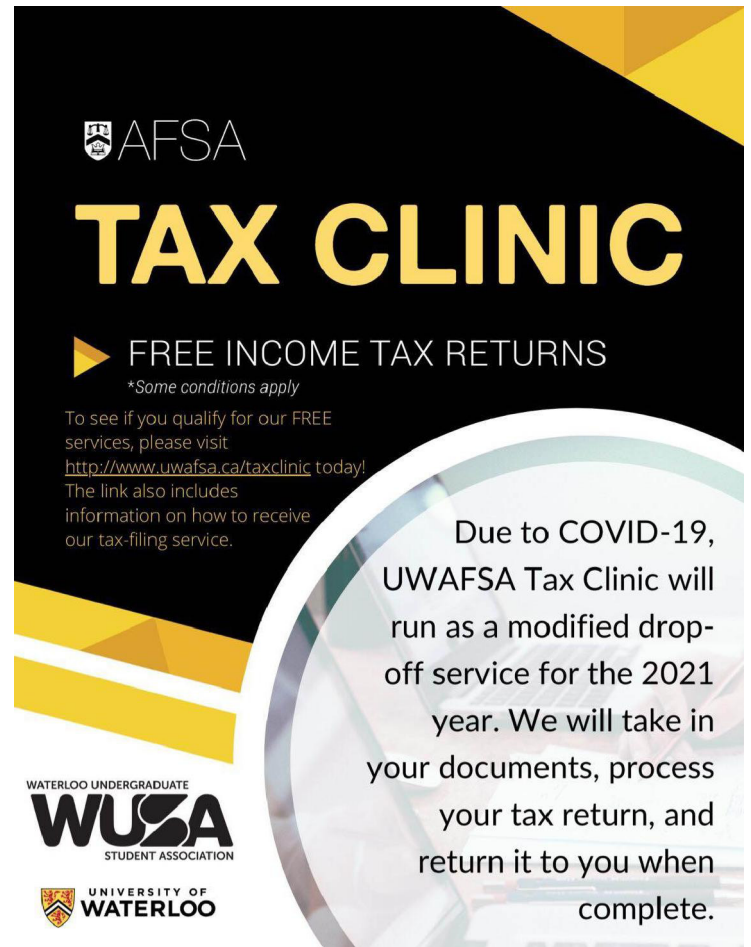
- “ Balaam smote his ass... stop snickering!
- “ The University of Waterloo does not endorse Match.com or any other dating service.

**You should be concerned
if I were to stop biking to
the university.**

PROF. BENOIT CHARBONNEAU

AFSA TAX CLINIC

Tax season is here and AFSA is back with its FREE Tax Clinic 2021! A group of trained volunteers will provide free tax return services for low-income individuals and families. To see if you qualify for our FREE services, please visit <http://www.uwafsa.ca/taxclinic> today! The link also includes information on how to receive our tax-filing service.



The poster features the AFSA logo at the top left. The main text reads 'TAX CLINIC' in large yellow letters. Below that, it says 'FREE INCOME TAX RETURNS' with a yellow play button icon, followed by '*Some conditions apply'. A smaller text block says 'To see if you qualify for our FREE services, please visit <http://www.uwafsa.ca/taxclinic> today! The link also includes information on how to receive our tax-filing service.' On the right side, a circular graphic contains the text: 'Due to COVID-19, UWAFSA Tax Clinic will run as a modified drop-off service for the 2021 year. We will take in your documents, process your tax return, and return it to you when complete.' At the bottom left, the logos for WUSA (Waterloo Undergraduate Student Association) and the University of Waterloo are displayed.

Albert Li

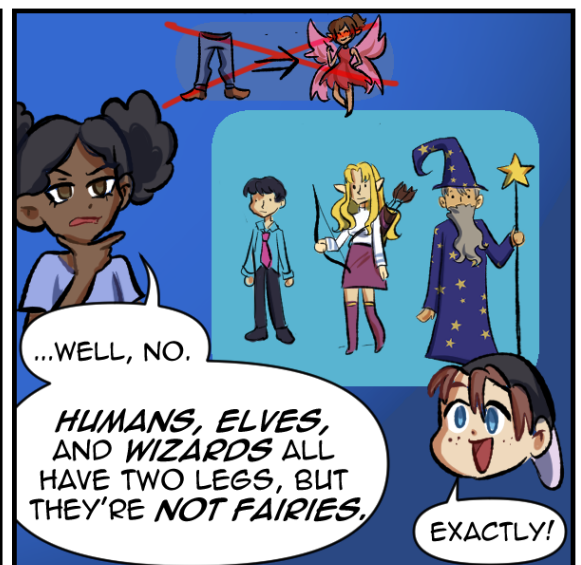
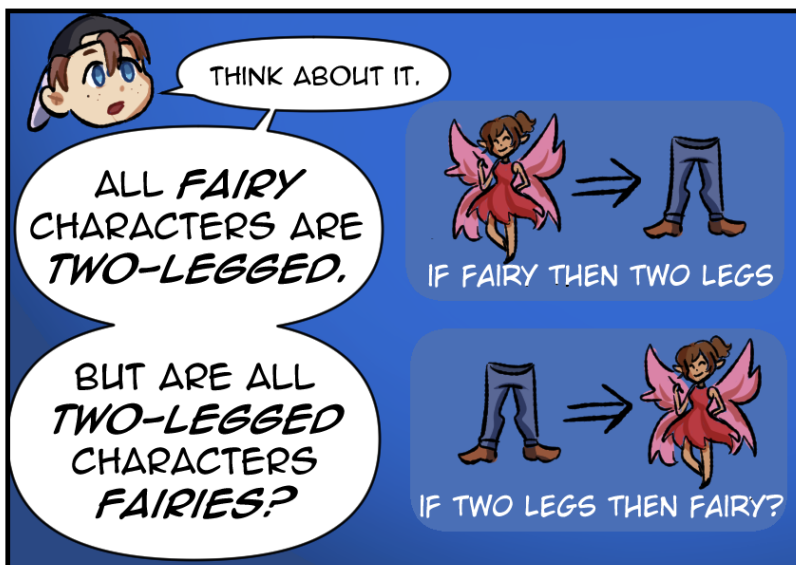
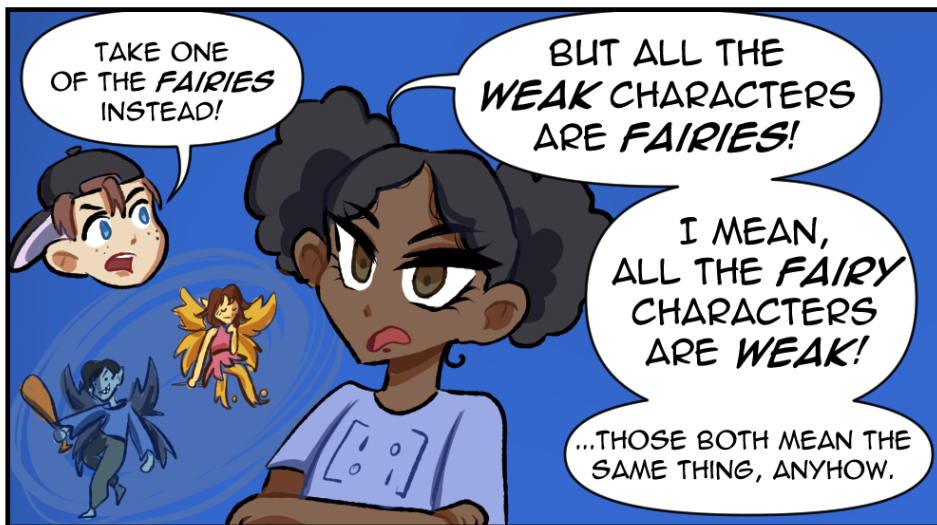
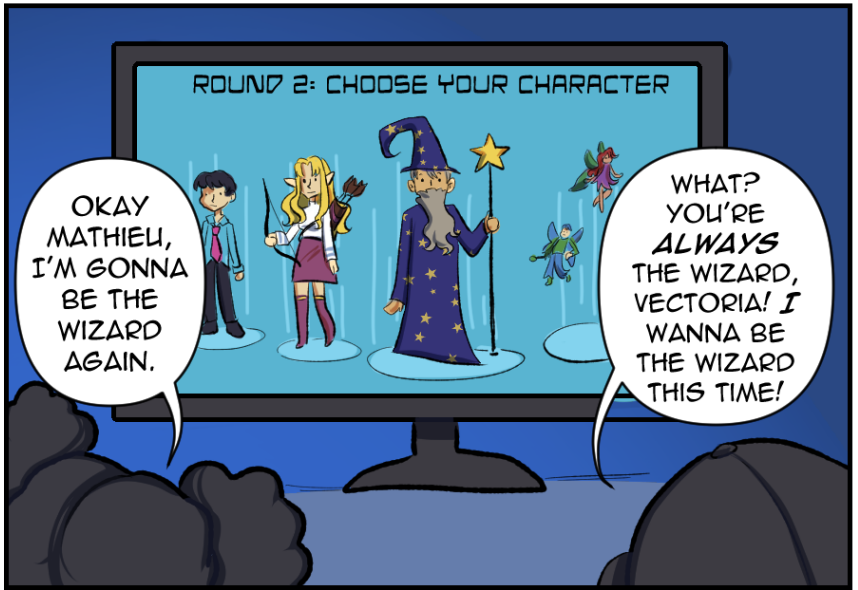
EPISODE 16: AFFIRMING THE CONSEQUENT

Enjoy Episode 16 of the MathSoc Cartoons series: *Affirming the Consequent!* Want more comics? Follow @mathsoccartoons on Facebook or Instagram! Got feedback, suggestions, topic requests, fan art, cute goose photos, or prayers to Ba'al the Soul-Eater? Leave 'em at bit.ly/cartoon_feedback or email mathsoccartoons@gmail.com!

Ava Pun

MATH 135: AFFIRMING THE CONSEQUENT


STORY BY AVA PUN | ART BY ALYSSA B.



MATH 135: AFFIRMING THE CONSEQUENT

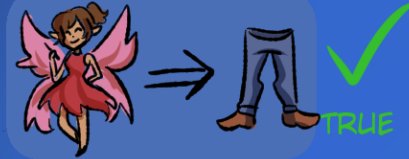
STORY BY AVA PUN | ART BY ALYSSA B.

"ALL TWO-LEGGED CHARACTERS ARE FAIRIES"



IS CALLED THE **CONVERSE** OF

"ALL FAIRY CHARACTERS ARE TWO-LEGGED"



A STATEMENT AND ITS CONVERSE MEAN TWO DIFFERENT THINGS!

IF A STATEMENT IS TRUE, SOMETIMES ITS CONVERSE IS TRUE AS WELL.

BUT OFTENTIMES IT ISN'T!


STATEMENT	CONVERSE
ALL EQUILATERAL TRIANGLES HAVE THREE 60° ANGLES ✓	ALL TRIANGLES WITH THREE 60° ANGLES ARE EQUILATERAL ✓
ALL NUMBERS DIVISIBLE BY 4 ARE EVEN ✓	ALL EVEN NUMBERS ARE DIVISIBLE BY 4 ✗ (WHAT ABOUT 6?)
ALL PRIME NUMBERS GREATER THAN 2 ARE ODD ✓	ALL ODD NUMBERS GREATER THAN 2 ARE PRIME ✗ (WHAT ABOUT 9?)

SO EVEN IF ALL WEAK CHARACTERS ARE FAIRIES, WE CAN'T CONCLUDE THAT ALL FAIRY CHARACTERS ARE WEAK.

THAT'S CALLED **AFFIRMING THE CONSEQUENT**, AND IT'S BAD REASONING.

FOR EXAMPLE, IF ALL 5 CHARACTERS WERE FAIRIES, AND 4 OF THEM WERE WEAK...

...THEN ALL WEAK CHARACTERS WOULD BE FAIRIES, BUT THERE'D STILL BE 1 STRONG FAIRY -



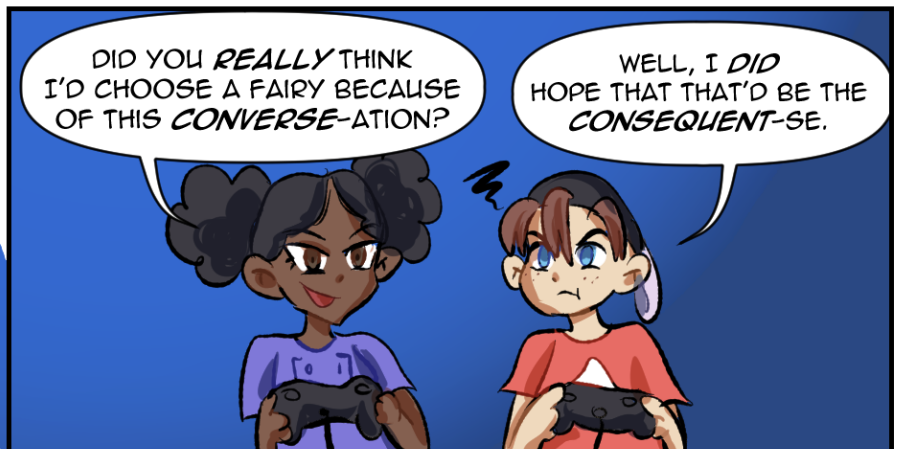
VECTORIA CHOSE THE WIZARD!

-HEY!



DID YOU REALLY THINK I'D CHOOSE A FAIRY BECAUSE OF THIS CONVERSE-ATION?

WELL, I DID HOPE THAT THAT'D BE THE CONSEQUENT-SE.



SOME PROBLEMS WITH STAT 231

STAT 231 has had a long-standing reputation for being a very poorly structured and oft poorly taught course. For those not aware, STAT 231 is a course in general statistics at UW, listed as a required credit for math students. Both STAT 230 and 231 are meant to offer math students a very broad coverage of probability and statistics at a fairly surface level. The idea is to give math students enough knowledge of probability and statistics to apply it in the areas they're studying as it may be needed, across many majors.

Recently there's been some discussion between MathSoc and the math faculty about this long-standing issue, but I'd like to pen to paper some of my personal thoughts of what I feel is most wrong with this course, and how it could maybe be made a bit better. I don't mean for this to be mean-spirited or provocative; I just want to offer some perspective on this from myself, a student grappling with the course this term. A lot of it will focus on teaching practices rather than course content, since I have more to say about the former.

1. COURSE CONTENT

A lot of students have been trying to push for an entire rewrite of STAT 231 for a long time. It's actually been brought up quite a few times in MathSoc meetings, and for good reason, but not much has come out of it from what I can tell.

Speaking strictly in terms of course content, it seems like the most sweeping issue is that it's too broad and general to be useful. I can't speak to this completely myself since I haven't yet finished this course; however, in writing this article I asked a handful of other writers, and quite a few actually recalled absolutely nothing from the course except for the vague notion of a confidence interval or p-value. The course content is too sprawling, and the many topics the course tries to cover lack any surface-level connection between each other. A large number of topics in the course aren't relevant to the majority of math students who aren't looking to pursue study in statistics. On one hand, the course seems to be interested in teaching some of the mathematics behind statistics, while on the other hand, it seems to also be interested in teaching the process behind planning and conducting studies. For most math students, the latter is likely to be what's most useful. The content is so torn and back-and-forth between these two sides that a lot of the content ends up feeling disjointed and awkward, with the pieces not quite fitting into each other. I won't pretend to know enough about statistics to say what belongs in a second-year general statistics course, so I won't talk much more about this and will spend more time talking about logistical and pedagogical problems with the course. However, from what I can gather, the prevailing opinion is that this course is in desperate need of a complete rewrite with more focus on a narrower range of topics that are more important for the average math student, saving certain topics for third year and beyond if students are interested in pursuing them.

2. TEACHING PRACTICES

In addition to the content, there are some really big problems with the delivery of said content. I'm mostly going to speak to the online slide-based lectures since that's what I use to learn the course content. The problems largely boil down to a lack of expressiveness, motivation, intuition and repetition.

Firstly, one of the biggest ones is showing some expression and enthusiasm for the material to give students a reason to be enthusiastic about it themselves. In the current online lectures, the speaker is fairly one-note and clinical, reading off exactly what's on the slide (spending an exhausting amount of time just reading each symbol of equations, not really productive). The speaker shouldn't be a narration of what's already on the slide in note form; the slide should instead be a pivot for more elaborate and organic explanation from the speaker. No matter the quality of the content itself, you can always make a course at least a little enjoyable with some visible animation and care put in.

Secondly, despite the presence of examples throughout the lectures, there's a real lack of consistent motivating throughline examples. When introducing a new topic, it really helps to start with some concrete examples that lead students to a problem for which they need to develop some theory to solve. This serves as a strong hook, leading into the meat of the content and giving students a reason to care, sticking to the example as a throughline and coming up with solutions later on. Pivot the content around this problem and make it interesting! There are a couple of cases where the lectures do this, and it's great when it does, but it needs to be done more consistently.

Moreover, tightly related to this is the importance of driving home intuition for the content. As mentioned before, STAT 231 doesn't have a very rigorous focus at all; most of the significant results used throughout the course aren't proven, and are usually accompanied by a single example meant to loosely support the claim. I can't entirely blame the instructors and coordinators for this; the backbone of most real probability theory lies in measure theory, and it isn't feasible to try and teach measure theory to a bunch of second-years in a general statistics course. This inherently creates a fundamental limitation in the course, since it's quite likely that a significant portion of the convincing arguments for these significant results are completely inaccessible. So, beyond simply stating the results as axioms and moving on, the alternative is to try and convince students in a more empirical or otherwise less formal way that's more in their grasp.

Too often, however, the lecture notes will introduce some new equation/formula/distribution, maybe do a little bit of algebra, and then tell students to effectively memorize it as it gets used in future lectures. Something equivalent is also done with some bad examples—for example, for the lectures on QQ-plots, I distinctly remember the discussion on interpreting QQ-plots consisting almost solely of a few examples

that corresponded to things to memorize. “If you see an upside-down U shape, it’s exponential or otherwise positively-skewed; if you see an S shape, it might be uniform!” When these statements are made without any real discussion on the reasoning behind them and how students would come to these conclusions themselves, it becomes really difficult to actually absorb the key concepts. Actual understanding and application thereof devolves into basic pattern-matching, and nothing of value is actually learned.

Overall, examples should be less overly-specific and there ought to be more emphasis on the underlying reasoning. At this point I imagine an instructor of STAT 231 may point to examples that can be found in the practice problems of the textbook, but this isn’t a solution. Online, balancing 5 or more courses at once, each demanding an assignment, quiz or exam every week or other week, very few students are likely to have the time to do enough practice questions to hit home the concepts.

Before moving onto the next topic, I also want to highlight the importance of repetition in lectures. With new topics being introduced every week, it’s really important to regularly, briefly refresh students on the big concepts; something as simple as reminding students how a confidence interval works informally, or briefly sketching something out to help students recall some appropriate intuition, can go a long way in cementing the big topics in students’ heads.

3. SUMMATIVE ASSESSMENT

Finally, there are some significant problems with how the course content is assessed. Most real learning happens through assessment, and so this is really important to get right; otherwise, the absorption of course material suffers even more.

Generally, the content on assignments is far too easy and doesn’t require much real thought. It’s mostly surface-level application of facts discussed in the notes, and I’m usually able to get through an assignment in an evening or so. In addition to how poorly it’s integrated in the course itself, R is integrated extremely poorly into assignments. For those who

haven’t taken the course, the extent to which R is a part of the course is that, for each assignment, the instructors provide a file with a list of commands to copy-paste into R, and these commands usually generate some sort of computation and/or some graphs. Often, entire questions on assignments consist solely of pasting in the output of the copy-pasted R commands (e.g. inserting a graph), sometimes requiring trivial changes like changing every “25” to a “35” or something. There is no learning to be had here. In using R at this level, the computation of numbers just turns into a blind process that doesn’t reinforce any of the ideas behind the computation; students seldom even have to think about what they’re computing or why. The fact that I can get a 90-something out of 100 on most assignments while barely knowing the content is concerning to me.

On the other hand, while assignments are borderline useless, Mobius quizzes for this course are *very* tightly timed (only 1 hour) and often test material in a way that’s much harder than the assignments, often requiring more deliberation. Put short, STAT 231 has assessment the wrong way around; if the instructors want to ask harder questions, they should allow students the time to properly think about them so that they can learn something from the experience! Fundamentally, time pressure like this is antithetical to learning through assessment. Rather than thinking carefully about the material, I’m trying the first thing that comes to mind, scrambling to crunch out numbers. In addition, this time pressure is made egregiously worse by quizzes all being linear (i.e. you cannot go back to previous questions, and you can only see the next question after clicking a button). This way, it is nigh impossible to partition time in a reasonable way, since some questions may take a few seconds while others may take a longer time, but students can’t know which questions lie ahead. So, if a certain question is taking more time, it’s usually more beneficial for students to just cut their losses and skip the question entirely. While I understand and appreciate instructors’ reasoning for this (that it is much harder to cheat on linear quizzes), I strongly feel most would agree that cheating prevention should *never* be done at the expense of the performance of honest students. No learning happens here; only penalty for not knowing the answer immediately, and this is completely unreasonable to expect of students.

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UW’S BASTION OF ERUDITE THOUGHT SINCE 1973

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Balancing all of this along with the duress and anxiety created by the existence of such a time limitation creates a steep artificial difficulty to quizzes, where the mark a student gets isn't in any way reflective of their ability to reason about statistics.

Due to this, I'd honestly recommend scrapping the tightly-timed quizzes entirely. This is a change I'd recommend just the same for in-person assessments too; they suffer from exactly the same issues, and it's very widely accepted as fact that they do an exceedingly poor job at assessing students' real knowledge and ability. If instructors really insist on keeping them, they should at least consider swapping the material tested on the quizzes and the assignments. The questions on assignments typically seem better-suited to quiz questions where you aren't supposed to need to think as much.

As a last note on assessment, I can recall a handful of times that I've had quizzes with questions about what certain R commands do. *Why is this being tested?* R isn't a learning outcome for this course, and this has been made abundantly clear by how R code is provided to students for assignments with minimal to no editing. It's frankly ridiculous to assess students on what a certain R command does, when this is absolutely not part of the key takeaways students are supposed to get from this course. I think that properly teaching R probably should be a more prominent part of this course and STAT 230, but until this changes, there's frankly no good reason to be testing students' understanding of it.

Addendum: Having finished the midterm project a couple of days ago, I can say that it did not provide any learning opportunities very distinct from the assignments. I think instructors intended for it to be more like a paragraph-written report; but, providing questions in almost exactly the same format as on assignments, and having students do nearly the exact same kind of things, made it ultimately not very different from the assignments. I think the premise of making a PPDAC study isn't terrible, but the framing and direction was really poor.

4. CONCLUSION

I don't think I'm going to walk away from this course with any deeper of an appreciation or understanding of statistics as a whole. I think that there's value in teaching some basic statistics to math students, but there are some really significant changes this course needs to undertake in order to do that. I don't expect my rambling here to actually amount to anything useful or meaningful for faculty beyond being effortful complaining. I just wanted to get my lamentations with this course out there somewhere for someone to maybe hear. I hope that MathSoc continues to work with the faculty to one day rewrite and restructure this course, and I hope I'm here to see it become something students can enjoy.

jeff

WE ARE GETTING SCAMMED

Alright fuckers. It's that time of the year again. Canada has made the permanent decision to delete an hour from all of our lives. And to fuck things up even more, the University of Waterloo, upon the pretense that they are granting us a day, a blessed day, a day for mental health, for rest, GOD'S DAY OF REST, has scammed us beyond all sense of proportions. Sure, they advertise that they have given us 24 hours, but we here at **mathNEWS** are not fooled by this. This is a scam. A shamble. They have played us for absolute maniacs.

Daylight savings time is scientifically proven to reduce sleep and increase stress. We all know how it goes. You're doing your usual midnight homework grind, when you randomly remember that "oh right it's daylight savings this weekend" followed immediately by wondering "wait is it the one where we go forwards or where we go backwards" and then absent minded Googling about how daylight savings time works and then the annual "oh fuck" characteristic of the March month. You tell yourself "I should go to bed earlier today. I should. So I won't be tired." And then guess what you don't go to fucking bed. And even though you wake up with the same 6.5 hours of sleep you've been getting for the past three months you feel entitled to sleep in because *come on it's daylight savings time you should give yourself a break* and inevitably lose six hours instead of just one and hey come on since you've already got a late start you might as well take an extra long coffee break and stalk your ex's Instagram profile but now once you get down to your desk you're already groggy from sleeping in too much and what was the point?? What was the fucking point??? You just a lost a whole day and instead of blaming yourself you blame the Canadian Ministry of Time or whoever the fuck decided to agitate your fragile, precociously balanced schedule. But the University of Waterloo has decided to butt into this sacred tradition of anxiety and non-productivity. Unacceptable. We are getting scammed. Bring justice to this injustice. Citizens of **mathNEWS**: wake up.

A cool pen name

THIS IS NOT A TITLE

This is not¹ an article.

This is also not² content.

This is not boldblazer

P.S. This is not a post-article filler.

1. This is not a footnote.
2. This is also not a quick remark.

RATING SYNONYMS FOR 'PENIS'

phallus: 7/10, sounds regal or divine

member: 5/10, weak

erection: 6/10, not all encompassing but a good word

pee-pee: 7.5/10, embarrassing in the right way

mickey: 4/10, does this imply size?

lunch box: 2/10, who said that ever?

intromittent organ: 4/10, too long (lol)

membrum virile: 8/10, this sounds latin and romantic

nerve: 2/10: nope

propagator: 5/10, not bad

verge: 6/10, modern ring

pizzle: 8/10, close to pizza which is **mathNEWS** [Editor's note: I regret to inform readers the pizzle is not provided at **mathNEWS** production nights.]

loom: 7/10, baa

needle: 2/10, i feel like it shouldn't imply sharpness

pintle: 6/10, medieval sounding

cock: 10/10, iconic, somewhat sexy, rolls off the tongue

dick: 6/10, immature

prick: 6.5/10, immature but british?

knob: 6/10, disturbing but it's a fun word

chopper: 2/10, this sounds more like a vagina

tool: 4/10, not good in many contexts

dipstick: 3/10 sounds like too many other words

ding-a-ling: 6.5/10, see pee-pee

dong: 9/10, good word

shaft: 8/10, like an elevator

ramrod: 7/10, lol

boner: 4/10, what if it's flaccid hmmm

length: 4/10, exclusionary to chodes

meat: 4/10, gross; exclusionary to vegetarians

pudding: 0/10, who tf

manhood: 6/10, coming of age vibes

winkle: 2/10, good try

pisser: 6/10, i mean yeah

prong: 5/10, pisser just sounded better

putz: 4/10, eh

rod: 5/10, see ramrod

stiffy: 6/10, boner but better

willy: 8/10, funny

weenie: 6/10, wiener is better

wiener: 6.5/10, better than weenie

schlong: 9/10, almost perfect

whang: 6/10, the ng sound is good in general

Deriving for Cock

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

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

Oh, and these little **blackBOXED** quotes.

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

OPERATION S.T.A.R.T.U.P.

Take a moment and flash back to 2010. A younger UW Unprint is trying to play some video games, but his Internet is slow, and his computer even slower than that. So, young UW Unprint plays Flash games. Lots and lots of Flash games. And as all true gamers know, a premium source back then for Flash games was cartoonnetwork.com, home to all your favorite Cartoon Network shows, like, I guess, KND: Kids Next Door.

One of the games for that show was Operation S.T.A.R.T.U.P. I remember this game primarily because, as a child, I never beat it. In the spirit of Content™, I am returning to confront the challenges I failed to surmount.

LEVEL -1

So, I start out by Googling this game, and realize that Flash is dead, and also that my preferred Flash emulator, Supernova, is not compatible with it. Oops. Luckily, ruffle.rs, a Rust-based emulator, saves the day, and the game loads.

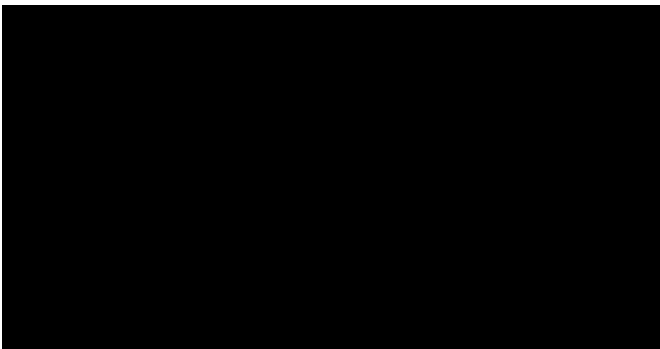
The game starts with a level select screen:



I remember vaguely that the bald kid on the bottom right is named Numbuh 1, so it confuses me greatly that he is level five. I start with level one.

LEVEL 1

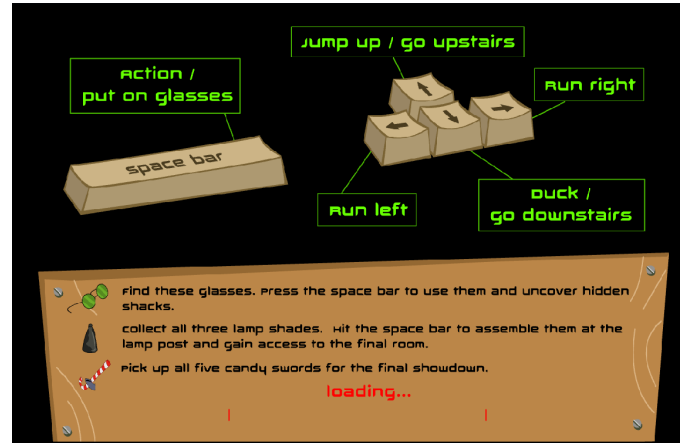
I click on level 1, and am greeted with a blank screen.



DISAPPOINTMENT

It turns out that none of the levels work.

But, I am not done. A quick check of the Ruffle logs reveals that the Flash file I downloaded is just a wrapper over other Flash files which it can't find, and a quick check at archive.org reveals that inexplicably, the files for this game still exist on the servers. So, of course, I download them.



DISAPPOINTMENT II

Turns out, there is yet another thing it is trying to load that it can't find. At this point, an insanity overtakes me and I download a Flash decompiler to try and figure out what it's loading. After some quick Googling, I figure out what's actually happening: the Flash game is waiting for itself to be fully loaded, but the emulator doesn't support that. But, the decompiler also shows me the Flash code, and it lets me edit it.

This reveals two things: one, the people who made this game are French, and two, there's a JEULOADE variable that looks like it might signal the game to move on.

```

1  onClipEvent (load) {
2      var totalbytes = 670000;
3      JEULOADE = true;
4  }
5

```

Can it be that easy?

Send more profQUOTES.

THE ENTIRE mathNEWS READERSHIP



Yes.

LEVEL 1.0

A quick lore refresher for those who, like me, didn't watch KND because they didn't have Cartoon Network in Canada when they were a kid: KND is about five kids who live (sort-of), in a tree house as part of a secret society: KND, the Kids Next Door. They fight the tyranny of adults, somehow, through long acronym-based operations, like the title of this game.

That's all I got for you. On with the game.

You play as the kid with the red hat, who has to gather candy canes to fight the boss with, lampshades for the magic lamp at center bottom, and also some glasses, so you can see the invisible houses which contain the lampshades. You do this by climbing stairs and dodging the candy pirate that throws candy at you. Easy as toast.

The villains in this show, I think, are supposed to embody the fears of children. Unless this kid is a health freak, though, I'm not sure why she's afraid of candy.

On my first try, I succumb to a combination of the candy, the fall damage you take for some reason, and the candy pirate's minion children that run across the screen and hurt you.

I only die one more time before I gather the secret lampshades, and the door to the boss fight opens:



I must do battle with the candy pirate himself. Unfortunately, in my overconfidence, I fail to read the instructions and I die. Back to the beginning, to gather the lampshades and candy canes anew.

It takes three more candy pirate fights before I defeat him.

LEVEL 2



Our hero this level is a boy with an orange sweater. His special talent is punching things really hard. Unfortunately, his arm-related gift comes at a cost to his legs: he cannot jump. Your goal is to plug in outlets, gather gumballs, and defeat a purple dentist.

Thank God for blackBOXES.

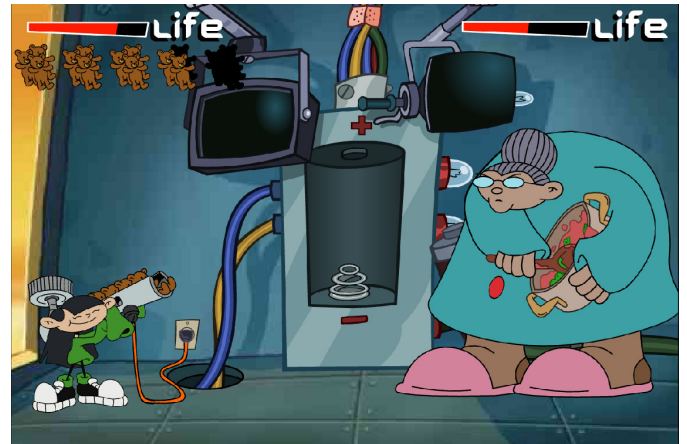
How would I have filled this empty space otherwise?

A GRATEFUL mathNEWS EDITOR



At least this fear makes sense.

center right, wielding a pot of what might be tomato sauce? Blood? Grapefruit paste? Again, I can understand this fear.



Same boss fight as always: shoot 'em with stuff. This time, it's grandma vs. several teddy bears. Grandma didn't attack once as I kept shooting here. She must be slowing down in her old age.

My first ever flawless victory: I manage to finish this game for children in one try.

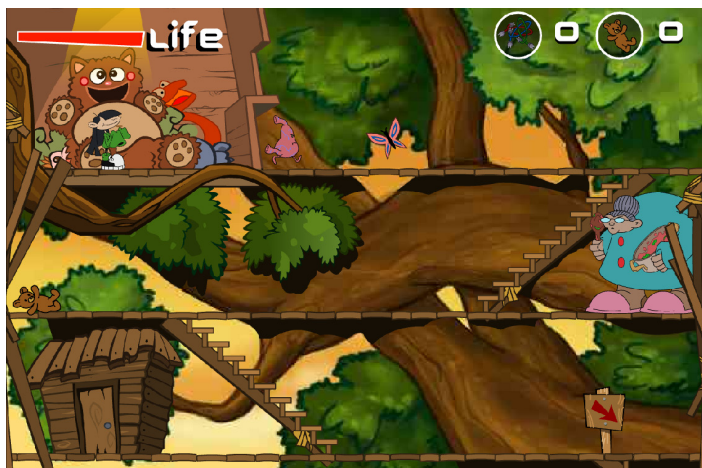
LEVEL 4

This next one is topical: you have to fight respiratory infection, AKA the common cold, at bottom left. Honestly, I'm just getting green Squidward.



This time, I have to shoot the dentist with gumballs until he, presumably, succumbs to tooth decay, setting a good example for children everywhere. Unfortunately, dental hygiene overpowers me and I die again. This time, it only takes one more death before I score a victory for plaque.

LEVEL 3



Same deal as always: gather small items, defeat large human. This time, you're the girl in green, top left, and you need to gather wires and teddy bears. Your enemy is the grandma at



Of course, to fight the common cold, you, the blue guy in the middle, has to gather orange juice. You also have to build a jetpack with tennis rackets. Aiding you in this task are minecarts, which you can ride in.

Unfortunately, your only special talent in this one is a lack of physical fitness. You have to climb stairs with your hands and feet, and instead of climbing down stairs, you just fall down them, making comedic noises. You also move painfully slow. Since obesity is a risk factor for COVID-19, our hero's chances don't look good.



Once you've gathered your orange juice, you have to fight the common cold scorpion by destroying its snot reservoirs. The jetpack frees us from the bonds of gravity and we easily dispatch our enemy.

LEVEL 5

This is it, gamers. Level 5, Numbuh 1, and closure for ten-year-old me, who probably could have finished this game if they had more than half an hour a day on the computer.

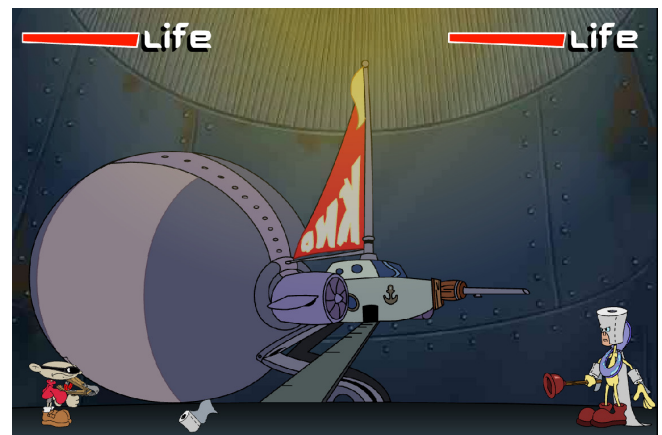


This level is just cool. There's a electric guitar soundtrack in the background, your kid character is bald, which is cool, and has cool kid sunglasses. He even climbs stairs two steps at a time. Numbuh 1 would have rocked the playground at recess.



Your enemy: **THE TOILENATOR**, for kids who are afraid of toilets. These kids are supposed to be ten canonically, but I guess they're a little behind the curve, potty-training wise (not that cool). **THE TOILENATOR** uses his plunger of death to hurl deadly toilet paper rolls at you.

Your only hope is to flip enough levers to do the thing, and gather the S.P.L.A.N.K.E.R., which slaps things, for your final battle.



Finally, we are at the end. Man vs. Toilet, the ancient battle we all face at the beginning and end of our lives. The routine is simple: dodge **THE TOILENATOR**'s toilet paper rolls until they arrive at an opportune angle for you to use the S.P.L.A.N.K.E.R. to reflect them back. Enough reflected toilet paper, and you'll be able to pee on his parade.

The spirits of warriors of old are with me, and I vanquish **THE TOILENATOR** in one life.

THE LESSON

After several hours and 5 deaths, what have we learned? Apparently, it was just the first level that was really hard. Turns out young UW Unprint also had a pretty bad attention span.

I love grad students.
They'll do anything you
tell them to.

PROF. ROSS WILLARD

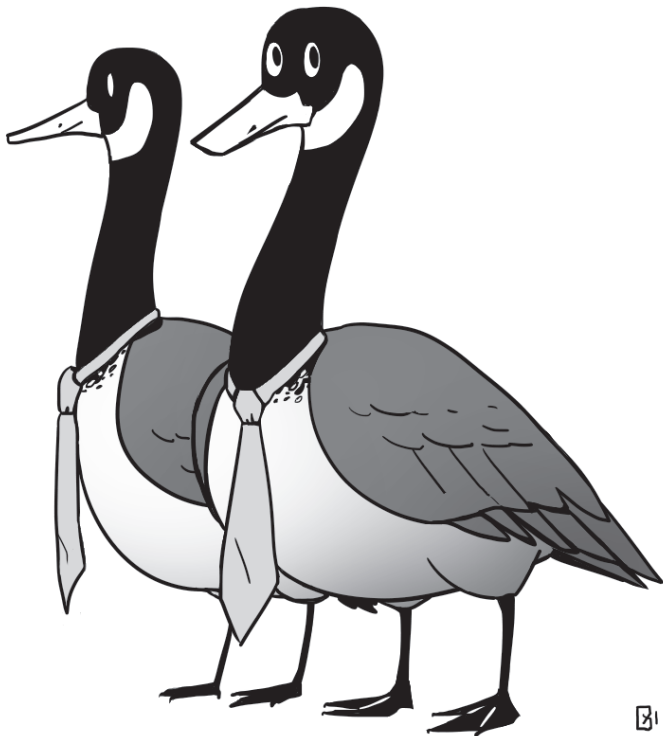
Also, the reward for confronting former challenges and surmounting them is just a boring “you win” screen.



Really? “Nice job”?

UW Unprint

PS: If you too want to embark on this spirit journey, the Flash files I used are available here: (https://drive.google.com/drive/folders/1Koeuzqg_IWBbMZQgny0hC5lIKVaIIfkS?usp=sharing). Drop them into ruffle.rs/demo, and they'll run.



I BOUGHT THE LITTLEST LAPTOP FROM KIJIFI AND IT'S SO CUTE

IN WHICH A WRITER IS NOT ADDICTED TO BUYING SECOND HAND LAPTOPS, NOT AT ALL, NOPE.

Back in v143i1, I wrote an article titled *Operation Memphis: Installing and Using Windows 98 in 2020*, where I installed and used Windows 98 on real hardware, to show the misguided mathNEWS editors of the time that Windows 98 was a fully capable modern operating system. Now, while that is true, I wasn't about to install Windows 98 on my main machine, mostly because I'm a Linux user.

What I did end up installing it on was a 2006 ThinkPad T60, which I bought from some guy on Kijiji for \$40. I called this laptop tungsten, since all my machines are named after periodic table elements (my main laptop is hafnium). So I installed Windows 98 on tungsten, wrote the article, and all was well and good. Now what? To be honest, I didn't use tungsten much. Most of the time, it just sat there and I had to carry it around whenever I shifted places. But that was fine, because tungsten was a good laptop—it was decently fast (blazing by 2006 standards, alright today), had a great keyboard and screen, and it was built like a tank. Still, it was taking up too much room for its use, I ended up selling tungsten to someone for \$60 (for a tidy \$20 profit!).

While that did leave my wallet full, it also left me a bit empty inside. tungsten wasn't used daily, but I did use it for the occasional experiment—trying a new operating system, running a temporary file server, and fun things like that. Now that flexibility was gone, and to be honest, I wanted it back. So I started looking for another laptop to fill the tungsten-shaped hole in my heart.

I set myself a budget of \$60, since that is what I had in cash for selling tungsten. (Side note: why does everyone on Kijiji prefer cash when Interac exists?) Armed with the money, I started messaging every cheap laptop owner in KW with lowball offers. In the end, I found a ThinkPad T42p for \$30—half the budget, and an older model. I didn't mind.

So I went to go and collect the laptop, and the owner saw I was a student... and he gave it to me for free! It was very generous, and I really appreciated his kindness. Thank you, if you're reading this (unlikely)! However, all was not good. When I came back, I immediately sought to remove the owner's install of Linux Mint and put on something fancy, like FreeBSD. Sadly, something went kaput in that laptop, and halfway through the setup, it stopped detecting USB devices. So now I had a laptop that wouldn't boot FreeBSD because it wasn't fully installed, wouldn't boot from a USB so I could fix it, and wouldn't boot a CD because what sane human being would have a CD drive and burner to make a CD for it?

So anyway, I bought CDs and found a friend with a laptop that had a CD burner... we tried various 32-bit operating systems (this laptop was old enough to not support 64-bit), but nothing worked. Everything either failed to boot because of the lack of modern features on this laptop like PAE, or had troubles formatting the ancient hard drive. I've named this machine molybdenum, and right now, it is in limbo. I haven't completely given up on it yet, but I fear it'll be a while before I can get molybdenum doing anything productive. In the meantime though... I don't have a working second laptop, and I haven't spent any of my money... time to go shopping again?

After some looking (and relaxing the requirement that it *had* to be a ThinkPad or Latitude, because I realized that was keeping me from some really good laptops), I found the laptop I'm typing this on right now; an ASUS Eee PC 1005PE. Let's take a detour into the story of netbooks.

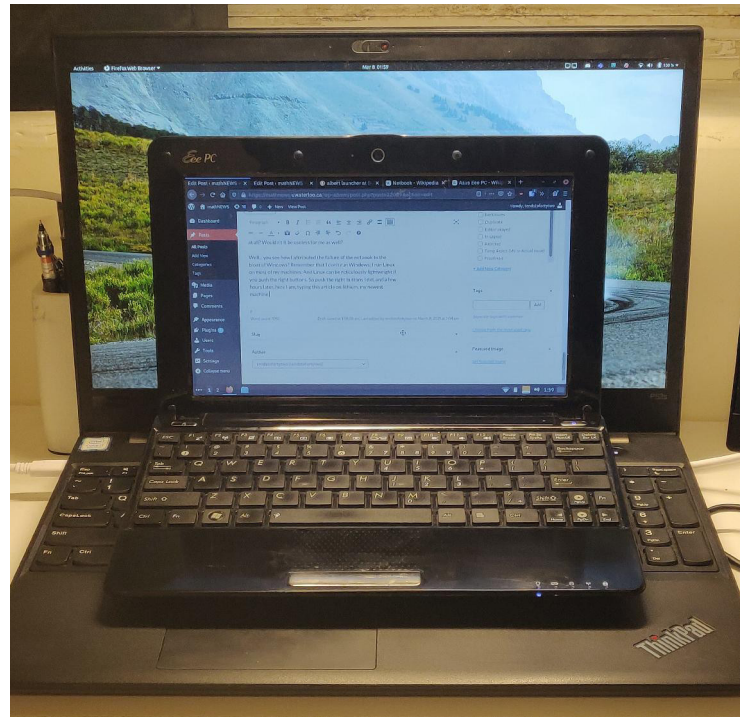
Back in 2007-ish, the computer industry had a dream. A dream, where they imagined that all your apps would be on the web. There would be no need for heavy processing power locally; all you would need is a device that could go anywhere and connect to the internet, and you'd be able to have all the experiences of a fully modern machine. A few years later Google would start the successful Chromebook project, showing that these manufacturers weren't wrong, just ahead of their time. But they also weren't right; the laptops they built, called "netbooks", were catastrophic failures. I attribute this to them making super-low-power CPUs and then throwing essentially full fat Windows onto them, which was something not a lot of those tiny machines could handle. They also had really tiny screens, making a lot of web media un-consumable on them. The ASUS Eee PC was by far the most successful netbook, and the 1005PE is one of the models from the middle of the Eee PC range, with a single core Intel Atom processor, one gigabyte of RAM, and 250GB of slow storage. Fit for running Windows XP, maybe, but these machines were shipping in the era of Windows Vista and 7, and needed a lot more power than they had to deliver a good experience on those operating systems.

The owner of this particular Eee PC probably realized how useless it was, because I was able to haggle him down from \$120 to \$40 by *literally just asking*. This has been the highest discount-per-unit-effort deal I've gotten on anything. Now, you may be wondering that if this laptop is so useless, why did I bother buying it at all? Wouldn't it be useless for me as well?

Well... you see how I attributed the failure of the netbook to the bloat of Windows? Remember that I don't run Windows; I run Linux on most of my machines. And Linux can be ridiculously lightweight if you push the right buttons. So push the right buttons I did, and a few hours later, here I am, typing this article on lithium, my newest machine.

It's surprisingly fast and enjoyable to use; with Arch Linux running the LXQt desktop environment (chosen because this laptop is a Qt-pie), it flies through normal tasks like cloning git repos, editing text files, and even browsing the web with multiple tabs open in a modern browser like Firefox. I didn't

expect that last one at all—I've had bigger, faster laptops chug doing the same kind of work (running Windows though). And it does this all in a tiny, adorable footprint—here it is compared to my real life laptop for a size comparison:



IT'S SO TEENY-WEENY AND CUTE :3

So yeah, that's my new experimental laptop. It's tiny, cute, faster than I expected, and in the process of changing from my old experimental laptop to this one, I got \$20 and another, potentially not-broken laptop! What a deal.

I hope I'm able to fix molybdenum at some point, and I also hope that lithium has a long, fun, and productive time with me. I have so many ideas for things I want to do with it already... it's going to be a great few months ahead!

tendstofortytwo

There is no real logical connection between what I just said and what I'm going to do next.

SURYA BANERJEE

sexNEWS

WE ACTUALLY GOT GOOD QUESTIONS THIS TIME!

In a stunning turn of events, we actually had plenty of good questions submitted for this issue!

As always, feel free to send your questions to mathnews@gmail.com to be potentially answered in this column. Anonymity is guaranteed¹. You're also welcome to include additional information to give context that you don't want included in the article if you're worried that your situation is specific enough that fully explaining it would expose you. Contrary to popular belief, this column is not restricted to just romantic relationships.

I have been with my boyfriend for many (≥ 5) years. I want to make new friends and also reconnect with old ones, but every time I try to hang out with anyone other than him, I just keep thinking that "I would rather hang out with my boyfriend right now". I do hang out with other people with my boyfriend as well, but it is not as fun as when it is just the two of us. My boyfriend never had any friends. Is this normal, and also, what do?

Five years is a long time! Congratulations!

I think there are multiple questions in this question, so let's get into it.

I think it's normal that you'll want to hang out with your boyfriend more than other people. After all, I would expect that after five years your boyfriend is one of the people that you're closest to. That said, I think it's important for your own mental health and personal development to interact with people besides your boyfriend. In addition to spending time with your boyfriend and others at the same time, you should also take time to hang out with your friends on your own at times, without your boyfriend.

It's not a great sign if your boyfriend has never had any friends, but that also depends on why. Some people are awkward especially in high school, and may not have many friends going into university. Some people just prefer to have a small group of really close friends rather than a lot of less-close friends. You should encourage your boyfriend to spend time with others without you and make his own friends. Just as it's important for you to spend time with people besides your boyfriend, it's important for your boyfriend to spend time with people besides you.

So what do? Talk to your boyfriend about why you feel it's important to have friends besides each other. Encourage each other to join clubs, groups, etc. to make your own friends without involving each other at every step of the way. And continue to hang out with friends together. Of course, it's still important to have some alone time for just you two.

How do I support a friend who is extremely lonely and desperate for a relationship? She gets very attached to people after only talking to them for like 5 days then gets extremely upset after they turn out to be rude or stop talking to her. I told her to join a school club but she told me that those are cringe.

I think the first thing to consider is if you think your friend is ready for a relationship. If they get upset because someone they've known for only a few days stops talking to them or is rude, how would she be able to handle rejection, or getting dumped? A lot of people think that getting into a relationship will solve their problems of loneliness when the reason they're lonely is really because of something else. If your friend doesn't have many other friends, or doesn't have any hobbies, then there may be things she needs to work on before looking for a romantic relationship.

As for how to help them after they deal with that? You should continue encouraging them to go out and meet people. School clubs are a great way to meet people, and to be honest it's cringe that they think clubs are cringe. Clubs are a great way to meet people, but if she doesn't like that for some reason she can also try dating apps, going to a bar, or asking a friend to set her up.

The only friends I have left are those who are relying on me to perform emotional labour for them in some way or another. I don't even find them fun to talk to anymore. I want to make new friends but I am terrified that people only stay close to me if they need me.

Content warning: This answer contains mild discussions of suicide and depression.

I dealt with a friend in high school who I also felt was relying more on me for emotional support rather than friendship. Whenever I'd try to talk to him about interests we used to have in common, he'd always change the topic to how he was depressed or discussions of suicide. Eventually one day after he had a mental breakdown at school I was called into the guidance office since I was one of the few people that the guidance counsellors knew was a friend of his. Long story short, they put me in contact with his parents so I could notify them if he was a danger to himself. I made sure he knew, and after that he seems to have decided that he didn't want to talk to me much anymore. And while I do sincerely hope he's doing well, that was a big load off my shoulders. Managing your own emotions and relationships is hard enough, taking that task on for other people can be exhausting (I realize the irony in me writing that as someone who does a relationship

Can't wait to introduce you to Sungmin Chee!

AN EDITOR WHO WOULD LOVE TO HAVE YOU ON THE mathNEWS DISCORD

advice column). If you really don't enjoy talking to these people anymore, then don't. As for making new friends, find people that you have common interests with. Most people will stay close to others simply because they enjoy spending time with them.

I am currently in a situation where I have made a lot of friends but they all seem temporary. How can I make this last?

I've been in this situation a few times. I think the number one thing to do (after pandemic) is just to make plans to hang out with some of your friends specifically. This especially applies if you mostly hang out with them at a school club or something.

Go do something together outside of the club. You probably won't keep all of these friends forever, but you should be able to keep a few close friends for the long-term like this. And at worst, you'll just have some fun with your friends and be back where you started.

Senior mathNEWS Relationship
Correspondent

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

N THINGS I MISS ABOUT THE CAMPUS

One year has passed since people fled their beloved schools around the world. Here is some stuff that I miss about UW.

1. The OG comfy, not the lame post-modernist plastic chair comfy, but the drip brutalist leather sofa comfy. Although the room smelled like feet most of the time, it was my second home. (Besides Gear lab, of course.)
2. Free snacks you will get from MathSoc if you pay their fees. It will take roughly 300 pieces of candies to break even, assuming 5 cents each. That's why I always took 10 every time I went there.
3. Rubik's cube and other small puzzles in PMC. It's not like I know how to solve them. I loved the ASMR when I watched people solving it, and the ASMR of me scrambling it after they solved it.
4. Pizza night at **mathNEWS**. I farmed their pizzas by pretending to work on an article after filling the **mastHEAD** and **mathASKS**. I think I own about 7 articles. I certainly hope no one from **mathNEWS** read this. If they do somehow read this, I am sorry, I will make up for it. Like this one, I promise.
{Editor's note: It's okay. We believe you.}
5. The SLC shuttle service, fast travel to anywhere in KW free of charge.
6. The fireplaces around the campus, they're under-utilized. My favourite location is the one around Columbia Lake. I went there with UW Space Society, vibing over the fire, eating s'mores and glazing at the infinite space beyond the night sky.

7. The greenery and wildlife of Waterloo. Hope the geese don't get too hungry without me feeding them Doritos.
8. Random events and clubs you can just drop in, From Archery one day to watching anime with Ctrl-A the next, there's always something for you to look forward to.
9. The unique fragrance of the campus. The smell of preservatives and chemicals in science buildings. The stings of disinfectant in Health Services. The scent of machines and lubricants in engineering quarters. The fresh aroma of the waterfall in Env 3. The body odour in MC. The perfume of success in Hagey Hall, All part of the UWaterloo blend.
10. The food of campus, the jerk chicken sold in International News. Aunty's Kitchen sold in Math C&D. The delicious snacks from the Food Club. Korai beef with rice in Kismet at Plaza.
11. What I missed the most is the people. Not just friends and people that I hang out with, I am longing for everybody who was here: the old man standing by the rail, the chefs in Mr. Paninos, my roommate that sang in Punjabi at 2 am. And the countless students I walked past. Despite coming from different backgrounds with divergent paths in life, here in Waterloo, it's like we share a silent vow of comradery. More than ever, for many that are no longer able to be together today. We still are facing the same storm, glancing at the same constellation. Till we meet again, I missed you.

me

Being a mathematician requires imagination.

PROF. BARBARA CSIMA

mathDATES: BUSINESS AS USUAL

DÉJÀ VU? NAH, THAT'S JUST YOU.

Welcome to **mathDATES**, the biweekly blah blah relationship and sex advice blah blah way better than **sexNEWS** blah blah don't ask me more questions because I got one thousand of them in my backlog blah blah. Capiche?

What do I lead with when I slide into someone's DMs?

SLIP 'n' SLIDE

I must confess that social media is not my forte. Don't get me wrong—I have no problems with online dating. But Instagram? Twitter? Ticktock? I just can't get myself into it. I'm the private type, believe it or not (all the things I've mentioned in **mathNEWS** don't even begin to scrape the surface of my day-to-day life). But in any case, I've got a good grasp on the theory, so you needn't worry too much. After all, this is **mathDATES** we're talking about.

From what I gather, the art of sliding into your hunny's DMs is a delicate balancing act. On one hand, it's no good to start off with a monosyllabic “hey” or “hi,” lest the object of your affections leave you on read to talk to someone more interesting. On the other, it's pretty bad when their first impression of you is an unhinged maniac who comes on too strong. Save your tell-all about how you were raised by coyotes in the wilderness of the Yukon until you were forcibly socialized into human society at the age of thirteen for the third date. Speaking from personal experience here.

But sliding into one's DMs takes more than just the tightrope walk. Your profile is key in making that first impression. So you'll want to make sure that there are lots of pictures of you holding a big fish on it, demonstrating to your love interest your ability to provide for the needs of your future family. Also it has been statistically proven that the bigger the fish one can catch, the girthier the dick / wetter the pussy. Show off what your momma gave ya.

Next question!

Where's the best place to have public sex on campus?

THE REASON WHY MATHSOC GOT RID OF THEIR OLD OFFICE COUCH

I will refer you to the **mathASKS** of recent issues, specifically, the answers to πillow Princess's oft-asked question.

Next question!

How do I convince my boyfriend to let me peg him?

MILF MARGARET

We'll take a page out of your PSYCH 101 textbook for this one. Do the following steps:

1. Ask your boyfriend to say “I wanna get pegged so damn bad by my hot-ass MILF-y girlfriend.”
2. If your boyfriend complies, reward him with a piece of his favourite candy or a scratch behind the ears. If he resists, use a spritz bottle to spray cold water on his face.
3. Repeat the above two steps once per day until the operant conditioning kicks in. Once your boyfriend is consistently able to say the phrase once a day, up the number of times you ask him to say it each day gradually, until he can say it five times in a row without hesitation.

It will take about a year until the process is complete, but you can be abso-posi-lutely sure that, due to the effects of cognitive dissonance, he *will* come around to the idea that the phrase suggests. Make sure you integrate this routine into your lives as naturally as possible—most people find the idea of being unconsciously manipulated and trained like a lab rat to be distasteful, somehow.

Next question!

What is the most vanilla sex possible?

ICE CREAM, YOU SCREAM

It's when you and a person you love very much

[REDACTED] and
[REDACTED] while you
grab [REDACTED]
[REDACTED] and as you're
[REDACTED] your partner [REDACTED]
[REDACTED]. Then [REDACTED] making sure to only touch
[REDACTED]
[REDACTED] inserting [REDACTED]
[REDACTED] but [REDACTED]
so that [REDACTED] and both of you
[REDACTED].

Oh, and the position is missionary.

Next question!

Is it a good idea to send your crush horse-themed haikus?

THE JOCKEY

Yes, forever and always! Here are some that I've tried with great success before:

*The reddest apple
Of mine eye, sweet and juicy
But beware colic!*

*Your dear face so long
Your hair like a braided mane
May I make you mine?*

*Gallop and canter
Thy beautiful ungulate
Your hooves have my heart*

*I want to ride you
Saddle up on your bare back
Let me hear your neighs*

As with any other love poem, you want to keep it sincere and from the heart. But if the words are eluding you, repurposing lyrics from a Megan Thee Stallion song will work in a pinch.

Finchey

NAME O. PERSON (AND SARAH)



Cix

warSOC III — WELCOME TO THE WATERLOO ANTI-MATHEMATICS RESISTANCE SOCIETY

I gasp as I step out of Theorem-space and into the warSOC clubhouse—the floor's not quite level, and I stumble into Name, blushing a bit as she rights me with her gentle hands and a smile. My gasp wasn't from almost tripping, though. It was from seeing the clubhouse.

The warSOC clubhouse is a mix between a big MC classroom and lounge. The door from Theorem-space seems to open out of one locker in a row of them lining the wall, each covered with varicoloured stickers and math paraphernalia. The lights have been dimmed to match a cozy living room; just enough to read by.

The front wall of the clubhouse is made up of whiteboards and roll-down projector screens displaying esoteric mathematical equations, pictures of geese taken in various environments, and maps decked with arrows and circles. A slightly uneven grid of forty or so school desks and chairs fills the front half of the clubhouse. A couple water bottles and loose papers lazily top some desks, and a short guy with glasses is typing on a laptop at one.

Comfy-looking sofas and seats decorate the back of the room, along with a dining table, bookshelves, a fridge, and a kitchen. Nerdy posters line the walls. A few people are napping or chatting softly. I see an exit sign and door, and a pair of washrooms.

I could almost pretend it was just a very large student lounge if it wasn't for the the left wall, opposite of where we emerged. A series of museum-style glass cases, each self-lit, hold a veritable menagerie of curios. Pink ties hanging on slowly-revolving carousels, medieval swords and armour, an abacus, and a dozen other eclectic items. A girl with a clipboard is walking between the display cases jotting some notes.

It's quite late, probably past midnight, but there's still quiet chatter and movement, like a graveyard-shift airport terminal. There's ten or so people in the clubhouse, including us. Name's found me another ice pack, and I gratefully put it on my nose.

"Thank ya. Where is this?" I ask Name in wonder.

"This is the seventh floor of MC!" Name says cheerily. "It's cozy, isn't it?"



Soren's disappeared to the back of the clubhouse, leaving me and Name with the guy with glasses I saw earlier. He's

pulled down a projector screen and has put on a pink-themed PowerPoint. It's titled "Welcome to **warSOC**!"

"Hello, friends. My codename is Vigil. I run **warSOC** operation support." Vigil talks fast, pushing up his glasses as he speaks. He's diminutive, looks younger than Soren, and wears a shirt that reads 'false (It's funny because it's true)'.

Vigil continues, "So it's way too late at night and **warSOC**'s not in the business of wasting time, so I'll skip all the 'I'm pleased to meet you' and just give you the whole spiel."

"**warSOC** stands for Waterloo Anti-Mathematics Resistance Society. We resist anti-mathematics. We're a multi-faculty society—though mostly Math students—with about twenty members that's been running for two years, funded by Plant Ops."

Slide change. Some old stern-looking woman. "This is the late UWaterloo professor Rex Sibyllan. First person to discover and enter Theorem-space. Led the big underground institutional research efforts into Mathematical Manipulation in the 90's."

Slide change. An artist's depiction of Theorem-space, complete with fractals and odd colours. "What is Theorem-space? A very special and very dangerous space superimposed on the normal world where you control everything with your mind and mathematics has absolute power. It's complicated, read one of Rex's books if you wanna learn more. Short version is that most of the work we do happens in Theorem-space, and we call any special stuff you do in Theorem-Space 'Mathematical Manipulation.' The bad geese try to do anti-mathematics through Theorem-space, and we do our best to stop them in Theorem-space. You can get into Theorem-space with a Pink Tie or permanent portal like the one in the locker over there you came through."

Slide change. A pink tie. "A Mathematical Manipulation instrument, and a whole lot more. We call 'em Pink Ties because they're pink ties. Acts as a Real-space Tether, keeping your mind tethered to Real-space—that's where we are right now—so you don't go crazy in a minute from all the mathematics in Theorem-space. Looks simple but they're a thousand times more high-tech than your laptop. Name has one there. You'll get one." Vigil points to the tie Name's innocently wearing. I'm not surprised. I've seen it what it can do in her hands.

Slide change. Geese surrounding a man sleeping in an office, in an eerie semicircle. "Some geese doing anti-mathematics. They sneak in and plant mathematical contradictions in the minds of mathematicians. The false statements aren't usually recognized immediately, and if the mathematician doesn't notice them, it breaks down the real math in their heads and they just... forget that part of math. And the contradictions stay. It messes with minds in a bad, *bad* way." Vigil shivers. "We have a theory that the geese take the forgotten math and do something with it. Not sure what. Soren noticed the anti-mathematics going on about two years ago and founded **warSOC** to combat it. That's why we're here. We can intercept

the contradictions using Math Manipulation by proving them false."

Slide change. A picture of some scrawled notes on paper. "The catch: what **warSOC** does, using Mathematical Manipulation, Theorem-space, and the associated technology, was banned globally in 1997. It was too dangerous, the potential to manipulate the purest academic discipline to extreme extent. The ban isn't in any public law—it's just in some of Rex's notebooks explaining why she shut down. All the research was supposed to be destroyed. The whole field of Math-Manip was some top secret black-ops stuff. No-one today remembers it, but Soren thinks that there might be some other secret organizations keeping an eye out. No-one's contacted us about it yet."

"How'd ya find all this?" I interrupt and gesture around.

"It was sitting here. This was once Rex Sibyllan's lab, and I guess she left it hidden after 1997. Soren found it one day picking locks when exploring. We've talked with Plant Ops—they know all about it—and they keep the fact we're here secret. You'll have to sign a secrecy pact too."

"Ya, I got questions." It's a lot to take in.

Vigil looks like he's expecting them. "Shoot."



Soren's back some time later with some papers. "Here's our constitution: read through it before you sign *this*." He passes me a booklet and a form.

"Signin' way ma soul or something?" I ask, only half-jokingly. The sheer weirdness of it all suddenly crashes over me in a tidal wave. What am I doing here? Mathematical Manipulation? Theorem-space? Geese? I pinch myself.

"Not a dream, Sarah." Soren chuckles. "Take your time."

I read through the constitution. Some of it is normal math club stuff: elections, appointments, membership. Then there's downright cultish sections, like the sections on "pledging to resist anti-mathematics efforts," "guard the secrecy of **warSOC**," and "pledging to act in the interests of the society." I'm hesitant, and a doubt is creeping in. Is this *actually* a cult?

But then it strikes me.

I've read a lot of superhero books, played a lot of superhero video games. Wordpress thinks they're low art, and prefers "*great literature*." But I fall in love every time with those fictional characters. Their selfless heroism and courageous acts. A beacon of hope in a jaded world.

Theorem-space isn't some made-up conspiracy. The geese could have left me for dead in there if Name hadn't saved me. They might be leaving someone else for dead right now. This is my chance to be a hero.

I pledge to uphold the warSOC constitution, to defend the innocent from the cruelty of anti-mathematics, and to work good in this world, the serif text on the dimly-lit paper reads.

And with a sudden heavy determination in my heart, I sign.



“Thank you.” Soren collects the signed form, and starts to walk away, then turns around. “Being in warSOC is very dangerous. And so incredibly important for the safety of the people in Waterloo. You'll be back here tomorrow and Sunday to learn some basics, but for the most part, you'll be learning on the job. I'm putting you on patrol duty Tuesday night with Name. There's been an unusually large number of geese around Modern Languages lately, and I want eyes and feet on the ground.”

Welcome to the Waterloo Anti-Mathematics Resistance Society. Get a good night of sleep, Sarah. You'll need it.”

“For sure, Soren.”

“Let me walk you home,” Name offers. “You've been through a lot today, and I'm sure it's a lot to take in.”

“I appreciate tha, thank ya.” Name and I walk out of the clubhouse, and emerge at the top of an MC stairwell. It'll be a long walk back, but I don't mind. I note Name's still wearing that formal suit and pink tie. “I like tha suit, Name—looks very attractive.”

She laughs a small, cute laugh and turns to me smiling, an eyebrow raised. “I'm sorry, I don't think I heard you quite right there, ice pack on the nose and all.”

“I said, ya got a very authori-tay-tive suit.” I enunciate carefully with a wink.

“Of course you did. Why, I'm flattered.” She winks back, and we continue down the steps, then out the door into the cold, clear night.

To be continued...

CC

ONE YEAR SINCE MARCH 13TH, 2020

THURSDAY, MARCH 12TH, 2020

I walk from King to Union instead of taking the subway. At six in the afternoon it is unusually bright, so much that I have to duck into the shadows of the skyscrapers so the sun doesn't burn holes in my retinas. It's a short walk that feels much less time consuming than the subway ride itself, and soon I find myself in the Grand Hall of Union Station.

(A long time later my mind would wander around this place while writing a final.)

In the waiting area adjacent to the GO train gates I text my supervisor on Slack; he's never hesitated to contact people about work during off-hours so I don't feel guilty about messaging him either. *I'm going to work from home tomorrow*, I tell him, *I should have the API endpoint ready for review by mid-day or EOD at the latest.*

He replies moments later. *Sounds good, don't worry about it. I'm going to work from home for at least next week due to the current circumstances, and tomorrow I'll send a message in the team channel encouraging everyone who want to WFH to do so.*

I send an emoji to show my enthusiastic acknowledgement of his message, and leave through one of the gates to catch the 6:35 train.

Our absence was to last longer than a week. On the afternoon of the next day (my endpoint having passed code review, of course), my friends who are in school that term tell me that the university is closing.

Most of them would depart no more a few days later, leaving hastily packed boxes and scattered scratch paper, like sunlight sieving through leaves in the rock garden.

**Did you know that mathNEWS is almost 50 years old?
Mark your calendars for January 2023!**

We might throw a party or something.

A mathNEWS EDITOR WHO'S RUNNING OUT OF THINGS TO PUT IN blackBOXES.

Three days—no, a week, or is it a month later?—I sit in a late night call with a friend. They tell me that right before school closed, they got in an argument with one of their friends. They wanted to go and properly apologize in person, but before they could do that, the school had closed and the friend had left on the first bus out.

I'm sure that the argument didn't impact their friendship at all, yet whenever I think about it I feel a sense of distant tragedy.

MAY–AUGUST 2020

Online school is non-trivial, but something about dealing with it while sitting in my high school bedroom while watching the branches on the cherry tree in the yard blossom into flowers and then to leaves makes it easier to endure. It almost feels like the overlapping of two timelines; in this one fixed point in space, the me of my past and my tired, confused present come together to work on our current hurdles. It is a good time to think about yourself, and the sky is often a blend of calming colours.

(This is a self-absorbed article. I'm unreasonably lucky, to be able to ponder idiosyncratically about who I am and what academic success truly is, in a world in so much anger and suffering.)

I start writing for **mathNEWS**. The first article I ever write gets Article of the Issue on the one that came out on my birthday, and I was to feel pretty good about myself for a while afterwards. I make a habit of this—there then comes something that borders on Alexander Hamilton commentary, and a listicle on MC.

I show the latter to my friend, who proceeds to tell me *milk tea, you've finally lost it*.

Shut up, I tell her, it's called magical realism.

It absolutely is not, but what it is, is an indication of where my heart belongs. At the beginning of September I pack my bags and find my way back to Waterloo.

SEPTEMBER–DECEMBER 2020

After you get a good amount of distance between yourself and the campus, the October nights of Waterloo are dim and comforting. Behind Ezra Street the sidewalks become covered with fallen leaves and sleepy streetlight, not easy to navigate but familiar nonetheless.

I've always thought that time flows differently in Waterloo than in everywhere else: when you're struggling to keep afloat in a sea of deadlines and to make it to next week time seems to go at a crawling pace, but before you know it it's already the end of the term. On the distant October nights it is not so, as time seems to be at a standstill, and though I have school and job search to worry about, those feel like the duties of a faraway life.

Companionship. I realized. When I moved back to Waterloo I had decided to move in with some of my friends, and after half a year of separation and the strains of a school term we had much to talk about. And so much of the conversation happened on these walks, in the damp, cool air of the tail end of fall. I don't know how much of my hopes and dreams I shared, but I'll be flattered if they remember a sliver of them.

If there's anything I learned from these times, it is that having someone who you can talk to about everything you're going through makes life significantly easier.

JANUARY 2021–PRESENT

Now that I'm on a co-op term, I unfortunately have way too much time to myself. In the lulls between tasks, I think of the concrete floors and the wood and stone ceilings of my office several school terms and co-ops ago, the last echoes of a time that seemed long past. I left a Cookie Monster mug on my work desk, and still it sits there as we speak, the blue ceramic catching dust in the changing sunlight behind the tall window. I'm a little encouraged by the fact that one day, I will come back for it.

In the March and April of past years, when there's still some snow lying around but the grass is just beginning to turn green, I used to take walks while The Band's *Acadian Driftwood* played in my headphones, like the cool spring melt waters of a northern river. Hope was somewhere around in the chords too, swirling and bubbling like the currents, parting when they encounter a river rock but eventually coming back together. When the weather gets warm again I intend to go look for it, though somehow that it's always been there: the hope, the faith that everything will carry on.

(It comes in a message, a handwritten letter, a notification sound at three in the morning. I'm glad that almost none of my friends and roommates are regular **mathNEWS** readers. I've rambled way too much in this article now that I'm a little embarrassed by it. I love you all, even if I don't show it or if I'm never around enough to show it.)

As a wise man once said: it really be like that sometimes.

royal no.69 milk tea

To misquote Bertrand Russell "I would advise you not to follow this advice."

PROF. KEVIN HARE

N TANGIBLE THINGS UWATERLOO CAN DO RIGHT NOW TO ACTUALLY BE ANTI-RACIST

AN OPEN TO-DO LIST FOR CURRENT AND FUTURE UWATERLOO STAFF AND ADMINISTRATORS TO BE FUCKING BETTER

- Remove support and funding currently provided through UW's ACURA (Association of Canadian Universities for Research in Astronomy) membership of the proposed 30 Metre Telescope on Mauna Kea which actively harms the Kanaka Maoli peoples on Hawai'i
- Divest in the fossil fuel companies funding pipeline construction through Indigenous territories at gunpoint, ESPECIALLY TC Energy, parent company of Coastal Gas Link and invaders of the Wet'suwet'en homelands since 2018—they have \$5 million of UW's money, PUT IT (and the other \$56 million) ELSEWHERE
- Remove barriers to getting financial help—less application bureaucracy (i.e. less of having to PROVE you're poor/hurt, or prove that you are cut off from your parents income; ideally just putting your info and how much you really need would be it), AND tuition decreases are easy to implement... especially considering how many folks UW has fired/laid off in the course of this pandemic, or just redistribute those funds you've accumulated or divested back to the students who need it most! That \$61 million previously invested in fossil fuels will also go a LONG way...
- Collect and publish racial data like you do about gender, from students to staff and beyond—UW collects everything else anyway, and nothing else can academically progress unless you have that tangible data and can study how a shitty campus culture drives retention rates of BIPOC individuals here
- Remove ANY requirement of having to be re-assessed for someone's disorders and disabilities when registering with AccessAbility services—disabilities do NOT magically go away just because your students are now adults, nor do certain assessments become magically out of date just because of switching schools, and many students simply cannot afford to be re-assessed as assessments are no longer covered by the student health plans like they were 10+ years ago
- Hire AND support more BIPOC faculty and don't force them out/ignore them when they bring up things about the institutions on campus that you don't like, especially in Math—I can think of only ONE Math instructor I've had who was Black, and they were a grad student....and I can think of a dozen more Black math students who left UW due to covert and overt racism in this faculty
- Fire instructors AND expel students who spout racist vitriol and other harmful and discriminatory dialogue regardless of tenure or impending

graduation/acceptance—start with BJ Rye (St. Jeromes), and Dipanjan Basu (Engineering)



University of Waterloo 
@UWaterloo

...

Replying to

Thank you for bringing this to our attention. We do not condone this messaging, are investigating this, and actions can and do include removing acceptances. Thank you for your patience.

2:21 PM · Jun 3, 2020 · Twitter Web App

TO DATE, NO KNOWN PUBLIC CONSEQUENCES EXIST FOR THE STUDENT'S RACIST ACTIONS REFERENCED IN THIS TWEET.

- Fire instructors who ILLEGALLY deny accessibility accommodations to students because they “don't need accommodations, they're just an unfair advantage” regardless of tenure—start with the previous CS 348 instructor who has consistently denied registered AccessAbility students their accommodations for YEARS
- LISTEN to the BIPOC students and faculty that are advocating for change and actually IMPLEMENT their recommendations and suggestions—didn't the Indigenous Student Association already talk to UW administrators about divesting from fossil fuels and removing support of the 30 Metre Telescope? Why haven't you done it yet? What else have you ignored from them and others?
- Don't DO things on your own without actually talking to and WORKING WITH the communities they're going to affect the most, especially when it comes to racism on campus—MANY administrative staff are white, and white folks should NOT be leading the discussions on issues that don't impact them
- Fairly compensate those doing anti-racism work on campus with a separate, competitive salary
- Conduct a study on the wages of BIPOC staff similar to the study done on women staff in 2015 that looked at UWaterloo's wage distributions, and pay those workers accordingly should there be any discrepancy in pay based on race
- Don't require all students to take a Black History course or and Indigenous Studies course—those who want to, and want to do the WORK of anti-racism, should undertake it of their own free will... everyone else will just resent you for it
- Change the funding structure of Counselling Services so students are no longer barred from

necessary help just because they have to take a term or two off for whatever reason, also just hiring more counsellors (especially Black and Indigenous counsellors) in general will help

- Abolish the Presidential Anti-Racism Taskforce—why can't the other organizations that have lived experiences with racism (the Indigenous Student Centre, Black Faculty Collective, etc.) be leading anti-racism work on campus THEIR way without the need for (white supremacist) administrative conformity and submission? You're just giving BIPOC individuals another barrier to fight through to be heard. Not to mention you only hired Dr. Chris Taylor (who specializes in anti-racism) to lead it for ONE MONTH.

- Restore the land title of campus and control of it to the Six Nations of the Grand River and have THEM oversee any new construction projects on their territory—Engineering doesn't need 10 more buildings, and Indigenous peoples should have a say of what happens on THEIR land that UW continues to illegally occupy; the Haldimand Proclamation has MEANING beyond our pitiful land acknowledgement
- Recognize that so long as UWaterloo exists, it will never be free of racism, as it was founded on white supremacy and stolen land to begin with... In other words, you have a LOT of fucking work to do...

#Equity4WhoHasADamnPoint

IF I COULD SAVE TIME IN A BOTTLE...

A PI DAY SHORT STORY BY ME

π day, for math nerds a day of celebration, for me it was a Wednesday. (this->author=me;)

Late again. I missed the bus because my jackass slept like in a coma. I had to run or miss my CSXXX lecture. Still reeling from the CSXXX result, my inner voice whispered, "...can't fall behind anymore..." Today's lectures were somehow finished in a second. So fast I couldn't recall anything. *Weird, too much Benadryl!* Gave my empty notebook a disappointed stare. "It's not like I am paying attention in classes anyway."

II

3:08 PM, breakfast time, heading to the plaza alone. I met an old man at the Firelink Shrine. (It's not really a shrine. I pretend UW is Dark Souls to cope.) He has been standing beside the train tracks by E5 since the Electroweak epoch. Unwavering, as if he is waiting for the hero of the franchise. I greeted the old man, "Hey Gwyn~, I see you got dat drip today." We had nice conversation on regret, forgiveness, and redemption. Before I went, the old man waved, "Take your time little one, have a nice trip."

What trip? I thought after ordering the secret menu with the chicken wings at the Mr. Paninos. This place has given me

plenty of indigestion, but it's a loners paradise. Unlike other places, I wouldn't feel sad eating alone while surrounded by groups of friends or couples. My favourite spot was the table for one beside the window. The tight space makes me feel like I was hugged even though it is just concrete and glass.

Canonically, Mr. Paninos has the best food in the history of Waterloo Plaza. Yet, I am still surprised by that taste of paradise. So homely and delicious, with the beautiful texture and wonderful aroma coming into my tummy. ~~Can't promise the same at the other end.~~ This perfect amount of nostalgia reminded me of my last ever meal I had with my family.

Munching on free peanuts, the owner and I had our usual welfare check. They were having trouble with raising costs and rent. I reassure them that better years have yet to come. In Chinese: "Boss, your place is so amazing, by 2020, you guys will have money to attend Tokyo Olympics and still have leftovers for next New Year."

"I wish," he replied. "So what's going on with you?"

I told them my usual struggles: bad grades and co-ops plus the loneliness felt after I was left behind by my peers. "...one foot

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THE mathNEWS EDITORIAL TEAM

out of this place one way or other, I had nobody to share my memory with. No one is going to call or mention me again. *There never seems to be enough time, To do what I want to do, Even If I find it, it's too late.* No second chances, can't do Jack now."

"Too young to delude yourself over it," the owner shook his head. "Besides, we will remember you, loyal customer."

"Because this is what I can afford," I muttered as I rushed to MC.



"These orphans are not going slaying themselves," I sighed as I reopen proc.c.

It's 6:17 PM, still grinding, I heard commotions downstairs. The MathSoc and CSC people were appearing to set up some sort of gamer moments at Math C&D.

Pi day. On one of those "special days" people celebrate, I learned to skip them because I had no one to celebrate with. Observing others having fun with each other shreds me. Diwali, Eid, Canada Day, Thanksgiving, Festival of Lights, Christmas, New Years', New Years' with rice, Valentine's Day, my birthday. I avoided them like a plague. *When did I become like this?*

If I had a box just for wishes and dreams that had never come true, it would become a supernova. "I keep letting them slip." Stood up, shoved my ThinkPad into my bag, fighting the numbness in my legs. "I'll make my own second chances; I won't let my dreams be dreams no more."

Waddled down to the third floor. First, I bought a leftover pie from the π day then ate it, tastes like math (pronounced with e). Then I moonwalked into Math C&D. Was rough at first for me fitting in with the murder of Zoomers (Ay CSIS, murder as a unit of measurement, not actual murder, don't deport me over this, please) in the room. Eventually, I found a spot. There I played Uno with 3 other people. Beginner's luck, I come in 3rd. Then we played Risk and a couple of other games. I never met any of those people and tomorrow they will become strangers again. *It's fine, methinks. Just for today, I find my people.* Present, without them ever knowing, at this moment, they are the found families of mine. I wish to save every day like this as a treasure.

After the game's night, it's already 9:25 PM. Passed by a poster made by CTRL-A. They are advertising their social event for tomorrow, I am free. "They will air My Lie in April, that's cash

money." Used my outside voice. "Maybe I going to shower tonight."

"Nah, I will fit right in."

3.14159

Paced around campus while glazing at the star-lit moon, listening to sadist geese's honking and mating calls from the fog. Smelled at the fresh wet dirt of the Waterloo spring.

On this same old path, looking at the same old scenery. Despite knowing every single detail of the campus skyline, tonight I could only see the silhouette as if looking through a heavy fog on my glasses. For many years I glanced at the buildings with dread, wished to escape this prison and be free. Yet today there was a heavy sense of longing for every step I took.

Moved to pass University Ave, as if it was saying good night to its children, campus slowing fad out of view. *Goodbye, University of Waterloo.*

Pi

I had already forgotten the faces of everyone by the time I returned home.

"Gui Dum it," wonder if I become psychotic, yelling at myself, *is that what isolation does?* "Why I didn't get their contact info, or even their names?"

Not again, my found family, like a mirage. Gone.

"It's okay, there is always tomorrow, this time with the cartoon guys."

12:34 AM, an email from the Register office about my appeal pulled me out of the Roblox virtual reality. They finally made their decision... pinched me just to make sure it's not a hallucination... *I am going to stay; I have another chance...* This is a miracle sent from the Most Gracious, the Most Merciful. I am in the right multiverse; this is a good timeline. *If I could save time in a bottle. The first thing I like to do is to save today, every day. Freeze it til eternity passes. So, I can spend it with you.*

In a psychosis of euphoria, I swung my little Beat Saber until 4 AM in the morning.

Then I remembered.

Pi day is going to be on a Sunday.

Then I cried myself awake.

It was PogChamp.

Proof: it's obvious.

PROF. STEVE FURINO

THE DAYS START COMING AND THEY DON'T STOP COMING

gridCOMMENT 145.4

Hi there! It's beginning to look a lot like springtime, and I don't know about you, but it's definitely brightening my mood. The sun is shining, the birds are chirping, the snow is melting and turning the ground into mud, the geese are looking a bit angrier...

I've once again received two submissions to the last issue's cryptic crossword. Both submissions were perfectly correct, and their responses to last issue's **gridQUESTION**, "What is the most plausible theory for how time-travel would work?" were:

adventurouspotato: "Go speedy make time go speedy."

- DistortedLight: "You create enough energy to literally make the universe undergo mitosis, and then you get placed somewhere in time on one of the two copies of the universe that got split from the original. Any paradoxes are localised entirely within the child universe."
- These theories both sound incredibly plausible. I will definitely be putting them to good use. For the prize of "getting to claim you have awesome

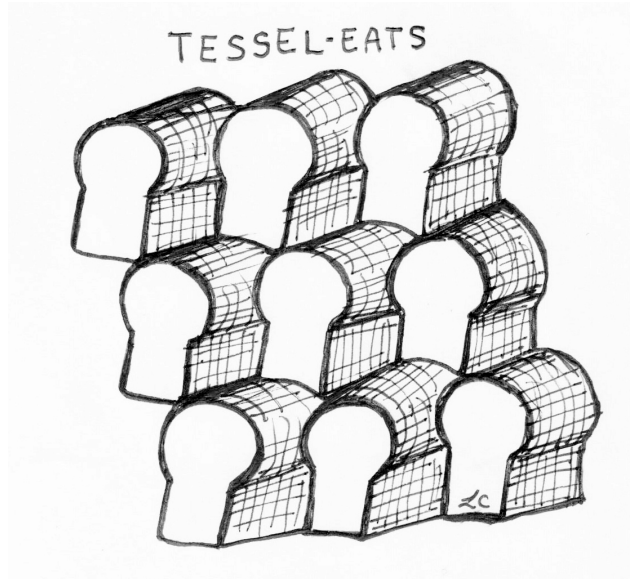
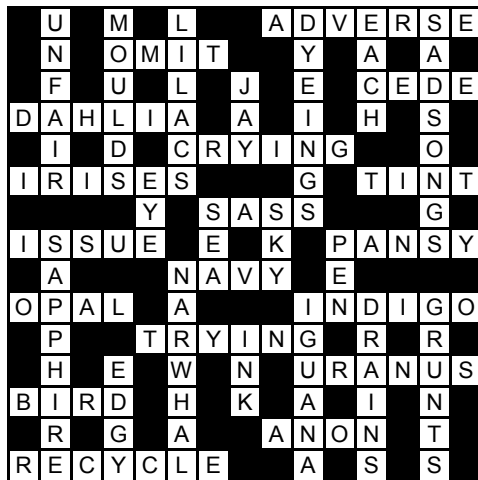
crossword-solving skills," this week's winner is DistortedLight for that incredibly detailed (for a **gridQUESTION** response) response. I appreciate the paradox localisation.

Hopefully no one was looking forward to a continuation of the colour themes because they have come to a very quick end. There are just not enough yellow objects to make a crossword with. Instead, this week I present you with "Around the World". Since we can't actually go anywhere, words on a page will definitely vicariously fulfil wanderlust. Right?? This week's **gridQUESTION** is, "What's the best springtime activity?"

Remember to email your **gridWORD** solution attempts to mathnews@gmail.com with your name or a moniker, and your answer to this issue's **gridQUESTION**.

Cloak and Vorpal Dagger

LAST ISSUE'S gridSOLUTION



Thoughts on this issue? Let us know with a letter to mathnews@gmail.com! We promise we'll read it.

A mathNEWS EDITOR WHO JUST WANTS SOMEONE TO TALK TO THEM

ACROSS

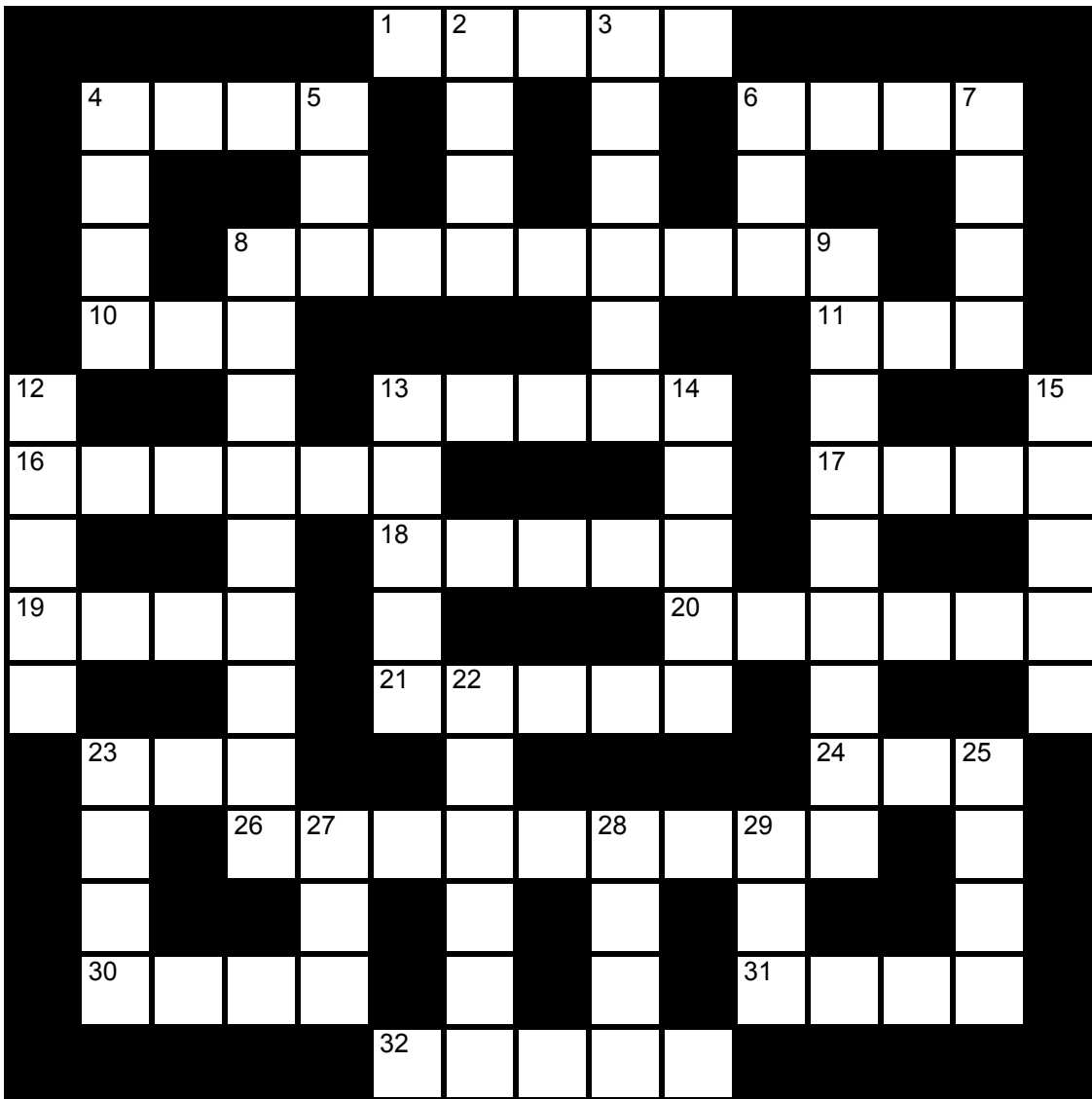
- 1. Packs tow in steamship (5)
- 4. Thief ends by fire beginning on estate (4)
- 6. Book, for example, bookended at end (4)
- 8. With difficulty, lug in bail, speaking two languages (9)
- 10. Grows endless oranges, primarily by relating to the earth (3)
- 11. Wacky friend makes a high mountain (3)
- 13. Show some languid etiquette (5)
- 16. Move to see contrived real TV (6)
- 17. Statistics given at ad playback (4)
- 18. Or, about the additional (5)
- 19. Large town causes to take a seat noisily, yes (4)
- 20. Fastened at deck, bizarrely (6)
- 21. All that's left is to cope by halting first for an era (5)
- 23. Fall behind, causing girl to be held back (3)

- 24. Attach to or bite back (3)
- 26. Spying ape is gone is agitating (9)
- 30. Pronoun of the year, essentially (4)
- 31. Space rock contained memo one (4)
- 32. Feeling buried in chosen sentiments (5)

- 12. Container lids tucked, causing jam (5)
- 13. Sphere has great beginning before becoming part of an organ (5)
- 14. Ground has a strange heart (5)
- 15. Touches down on the grounds (5)
- 22. Ruler disregards price containing seven at the end (6)
- 23. Secretly, cellos try to lead astray (4)
- 25. Back and forth on midday time (4)
- 27. "What's up" initially startles knowledgeable youngster (3)
- 28. Report is gross; north is north and south is south (4)
- 29. At heart, management is stone (3)

DOWN

- 2. Cab is essential to that axiom (4)
- 3. Being able to fly, almost suffered a sharp pain (6)
- 4. Extract banner out of lagoon (4)
- 5. Informative text introduces first year interest (3)
- 6. Eat fudge after calming drink (3)
- 7. Stumble during excursion (4)
- 8. Naughty boy gave no well wishes in french (3,6)
- 9. Peculiar spa candle makes up scenery (9)



Around the world, around the world...

A mathNEWS EDITOR WHO MISSES DAFT PUNK

lookAHEAD

SUN MAR 14

Pi Day

MON MAR 15

Scheduled pause day (no classes)

TUE MAR 16

Scheduled pause day (no classes)

Continuous cycle begins

WED MAR 17

St. Patrick's Day

THU MAR 18

Awkward Moments Day

FRI MAR 19

SAT MAR 20

First day of spring

SUN MAR 21

MON MAR 22

mathNEWS 145.5 production night

International Goof Off Day

TUE MAR 23

WED MAR 24

THU MAR 25

FRI MAR 26

mathNEWS 145.5 released

Make Up Your Own Holiday Day

SAT MAR 27

SO YOU THINK YOU CAN BE MEF'S NEXT EXECUTIVE DIRECTOR?

Are you an undergrad Mathie with some business, finance, accounting, or administrative experiences? Do you want to get involved in a student-run and student-funded organization that works to improve the Math undergraduate experience?

The University of Waterloo Mathematics Endowment Fund (MEF) is looking for an Executive Director for the Spring 2021 term! If you are interested in applying, fill out the form at: tinyurl.com/mefpdf

mefspring2021execdirec/. Applications are due by 11:59 PM EST on Sunday, March 21, 2021!

Learn more about MEF at mef.uwaterloo.ca or reach out to us by DM or email to mefcom@uwaterloo.ca for more information!

Math Endowment Fund

One of my first acts as a 33-year-old was twisting my ankle. My year's not off to a great start.

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