"WHAT'S YOUR SUMMER SIDE PROJECT?"

IF YOU'RE ONLY READING THIS TO FIGURE OUT WHERE THE gridWORD IS, YOU'RE GONNA HAVE TO READ ALL THE WAY TO THE BOTTOM, FRIENDO.

Classes are done! The end of summer is swift approaching! Fall term looms in our future, reminding us that the endless tumble-dryer of school term-co-op term-school term-co-op term will never truly end until we have that diploma in our hands, although that day seems ever unlikelier to ever occur...

But a new school year is also a good time to make a change. Sort of like how when the real year ends, people make New Years resolutions, we at **mathNEWS** suggest that you take this opportunity to make some resolutions that you can try to stick to for the next academic year.

Like, for example, writing for **mathNEWS**. Have you ever wanted to have your silliest ideas published so that anyone in the whole world can read them? Do you want to bolster your resume, so that you look like an especially great communicator? Do you have an issue on campus that you really want to write about? Do you think your writing is the purest wisdom and ought to be distributed far and wide?

Our first production night next term will likely be Monday the 11th of September. If you want more updates, you can email us at mathnews@gmail.com to get added to our mailing list, or like our Facebook page. If you aren't available for production night, but you still want to get published, you can email your articles in to us by noon on September 12th to make that week's issue.

If you're interested in becoming an editor, feel free to reach out to us by the aforementioned methods. We could always do with more hands on deck!

And if you're wondering where the **gridWORD** is, we usually reprint an old **gridWORD** for the last issue of the term, because there aren't any rewards provided for getting that one right. However, because nobody bothered responding to last week's **gridWORD**, we decided to forego the **gridWORD** this issue. If you really want to answer a **gridWORD** question anyway, feel free to slip a note under the door describing your favourite crossword layout.

See you next term!

TBDED
EDITOR, **mathNEWS**

SOME GUY	Not dying of heat stroke.
AUGUST MAURADER	It is classified.
SHAY BLAIR	Acquiring all the bees in the world for tbdED
GBAD	Learning Finnish, Dutch, and how to drink like a Finn.
DIMINUTIVE REX	99 Fletching.
DF	Art shit.
turnipHED	Paperwork
SKY BLUE	Genetically engineer Tracer from Overwatch.
HAT OF CHOCOLATE	Ascension.
FARTING PONY	Prancing around Waterloo attempting to locate my graduate studies funding.
TheUndecidED	World Domination?
THEODORE BEAR	Researching information for my co-op next semester at the University of Waterloo Department of Mysteries.
SCYTHE MARSHALL	Theoretically, research for my thesis. But...
tbdED	**mathNEWS**

LAST WEEK'S gridWORD SOLUTIONS:

Across solution grid:

1. SCARCER 8. AVOCADO
15. HONOREE 16. BEMUSED
17. OUTSOLD 18. BRITTLE
19. EGRESS 20. POSTURE
21. SHAHS 22. SATE 23. POTS
25. IRONS 27. ISLET
28. DESPERATION 33. AKA
34. ULT 35. FARINAS 36. BEG
37. BAA 38. ELECTRICEYE 39. ...
40. ABLER 42. HESSE
43. IOWA 44. BIER 46. TROTH
50. RAGLANS 52. BETCHA
53. CARLYLE 54. DONATES
55. UTTERER 56. ANCIENT
57. RESTART 58. TEENTSY

WELCOME TO HELL WEEK - MATH EDITION

In a school filled with programmers and mathematicians, one would think the scheduling of exams could be optimized for maximum student convenience, but the truth of the real algorithm comes out. We aim to maximize inconvenience, with some carefully chosen constraints to keep morale down.

Firstly, math students must end as late as possible - ideally on the last two days of exams, and optimally on the very last slot. Math students should be sitting in DC studying as the other students roll their suitcases towards home and hope. While this could potentially leave students with more studying time, an additional constraint is added to schedule the easiest exam last leaving ample study time for 100 level electives. It constrains all hardest, core level exams to be scheduled back to back, but just far enough to avoid actual conflicts and qualifications for exam relief. It hopes to maximize the numbers of students affected by choosing courses taken by most students in the same term, and scheduling them in the most inconvenient way. Whether you're in CS, CO or STATS, it aims to put your courses back to back to minimize study time and maximize sadness.

This algorithm also takes into account projects and assignments. Profs are encouraged to squeeze in one last major assignment before exams, preferably on the last possible day, to ensure study time is limited to exam days. Heaven forbid a student get started on exam material before the designated exam days.

E-Unit

THE END OF ALL (WELL, ONE) THINGS

6 years. 18 terms. Over 60 articles, at least one in every term.

It's not often you can quantify your experience with something. You can count the minutes, sunsets, or cups of coffee. Or in this case, the years, the pizza slices, the EOTs, and the words.

I can count the amount of time I've spent at **mathNEWS** production nights, but there are some things harder to count. The number of people I wouldn't have known otherwise. The amount of laughs. The writing skill I gained from being forced to write something, anything, every two weeks even if I didn't feel like it. The happiness I felt when someone told me they recognized my pen name because they enjoy my articles.

It's always strange seeing something end. I kept writing for **mathNEWS** after I graduated because I enjoyed it so much, but for me 6 years is where it ends. I joined in 1A, Fall 2011 because of my Orientation leader, and I've never regretted it. I

hope I still find time to write, and I'll miss the shenanigans at Production Night.

I remember when we had a god-awful submission system, so I submitted all of my articles in HTML via email. I remember 6 years worth of different editors with different styles. I remember writing articles about informational things like upcoming events, serious things like "When Things Go Wrong in Co-op", and silly things like "Deer are Fucking Terrifying". I remember my first article, a story I made up based on words from a random word generator. I remember writing Kickstarter articles, songs, sonnets, and 'N Things' lists.

Here's to the past 6 years of my life. I hope you're happy **mathNEWS**.

Until we meet again.

Yours in farewells,
Shay Blair

[We'll miss you, Shay. Thank you for your years of literary service -Turnip**HED**]

RARE HONOUR

If you're reading this, I've been eaten by a dragon. That's because as I'm writing this, I'm being eaten by a dragon1. While typically I'd be opposed to being devoured, this has actually been a really enriching experience. I mean, yes, being perforated by teeth the size of swords isn't great, but I'm part of something magical. Something bigger than myself2.

Plus, I'm getting the once in a lifetime chance3 to examine the digestive system of a mythical creature. If I actually had the time to take more detailed notes4, I'm sure they could be the foundation of a wildly successful academic paper. It's really a rare honour5.

$s,t \in \{2k, k \in \mathbb{Z}\}, 144$

1. Presumably the whole eating process will be done by the time this has been published.
2. Like, this thing is house sized. It's really magnificent.
3. Unless, of course, I somehow survive this. In which case I'm totally going for round 2.
4. And assuming of course that they could survive digestion/potential incineration.
5. Although if it decides to roast me midway through digestion, it'll be a well done honour.

A SECOND FAREWELL, FOUR YEARS LATER

I started at UWaterloo, in math, eight years ago. I graduated four years ago, and went off to the University of Victoria to begin my graduate studies, also in math. However, I still had all sorts of close friends still at UW. I came back two years in a row, to see everyone. But now, four years later, the only people I know who are still there are just finishing up, or are graduate students.

Hence, I think it's finally time to put the metaphorical pen that is my keyboard and password to the production system to rest. It's been quite an adventure, through my Triscuit articles and random mathematics and a two-and-a-half-page homework response and whatever else I wrote for these past four years. Hopefully someone got something out of my work; much like Beyond Meta, I also had a tendency to use **mathNEWS** as my personal diary, and so my articles were usually on whatever I felt strongly about at the time, for better or for worse.

To the readership: keep on reading! Potentially if only for the profQUOTEs, but preferably for the rest of the articles, too.

To the writers: keep on writing, be it for **mathNEWS** or otherwise! An outlet for creativity is to be cherished, and utilized to its fullest. You certainly found a great one here.

To the editors, past and present: thank you for all of your effort over the years. This is a somewhat thankless job, but know that I've appreciated your willingness to have me write from across the country, and your candour in dealing with my questions. I know it's atypical, but I think it mostly worked out?

I'll probably miss this, but I'll find something else, I think. We all move on, eventually. Sometimes it just takes longer than usual.

Signing off, for real this time,

Joseph Horan
aka Scythe Marshall

[We'll miss you, Scythe. All the best moving forwards. -**turnipHED**]

REAL LIFE TETRIS

Packing for any trip is the worst part of the trip. Packing for an extended trip, that's the worst. I have gotten it into my head that I need to survive the next two years of my master's degree on two suitcases. TWO. All those lovely packing tips on how to pack for your trip are garbage when you are packing for a longer period of time. They say things like; wrap outfits around each other, stuff your shoes with things (actually, that one's always a good choice), and only bring the things that you know you'll need because you can buy unexpected items while you're where you're going.

Wrapping clothing into outfits is dumb- when you're going for an extended amount of time, you're gonna need your clothes to mix and match and be parts of loads of different outfits. So it doesn't matter that your white bra isn't in the same 'bundle' as your white shirt and the pants that look best with them. Rolling your clothes is smart, but only if you can roll them in such a way that will take advantage of the spaces that solid objects leave you with.

You can stuff more than just your shoes with clothes! If you are taking a couple of water bottles, those are prime stuffing real estate. You can't fill them with liquid regardless of whether they are in your checked or carry-on luggage, so stuff them with a t-shirt or two. Every single shoe that you take with should be stuffed as well, but always pack the smallest shoes your can. Even in the middle of 30 degree weather, you're going to want to 'wear' your boots. They come off at security, and you don't need to re-lace them after that. (Obviously it helps if your feet are small cause you can fit a lot more things into a suitcase if your shoes aren't taking up a cubic foot.

As much as you can buy things while you are abroad, this only works to a certain degree. If you have a rain jacket, you should bring the rain jacket- no need to buy a new one when you have a perfectly good one already. Same for winter clothing- it may take up more volume than your summer clothing, but I would rather lose a few t-shirts than end up freezing as the weather turns because I got so caught up in the fun of travel that I forgot to buy new winter stuff.

Mostly packing for the long term comes down to TWO principles. Principle One: How often do I wear this now, and will I wear it when I'm there. If you don't wear that t-shirt very often now, don't bring it. If you are going to a place that is an eternal summer (equator), you're not going to wear your winter clothes no matter how much the Canadian in you thinks: "Just in case the weather turns".

Principle Two: FILL THE CRACKS. Between stuffing your shoes and your water bottles, and rolling your clothes so they can pack in more tightly, cracks of space can appear in your suitcase. This is what you keep your socks, underwear, and undershirts for! Fill those spaces like it's '99 and your graphics card can only handle Tetris and Minesweeper. (Forget minesweeper- don't hide bombs in your luggage. CBSA frowns on that.) The density of stuff in your suitcase should approach that of a black hole. It'll keep your valuables safer, and you'll be able to squeeze that much more stuff in there. Just be careful about how much it all weighs.

GBAD

A SENSE OF COMMUNITY

Last weekend, I had the wonderful privilege of playing in the Trail Maple Leaf Band's 100th Anniversary Concert, and participating in the entire weekend's worth of activities including group meals, a banquet, a picnic, and 16-or-so hours of rehearsal over three days (plus 2 more before the event officially started). I had the chance to see old friends, and meet old and new members of the band with whom I hadn't played. The concert itself was one of the most amazing concerts I've ever played, though I didn't play perfectly. Everything just... felt right, and felt momentous. Once I could see the director, anyway, two pieces in.

For context, I played in the band during my last three years of high school, 2006-2009 or so, and then during my summers back at home in my first two years of my undergrad, 2010 and 2011. It's a concert band, now, though its history includes many years as a marching band. It still participates in local parades, but now instead of marching, the band rides on a flat-bed truck instead. Its repertoire includes classic marches and war-time songs, but also all sorts of newer music. It plays concerts for seniors, the Legion, and the wider community; it provides the music for the local Remembrance Day ceremonies, and usually opens the concert portion of the festivities at the end of Silver City Days, Trail's community celebrations.

I say "the band", instead of "we", because I don't currently play in the band, and unless there opens a job for someone like me, a hopefully-soon-to-be PhD in mathematics, I might not come back to be a regular.

What I found, this weekend, was that the band provides a sense of community for both its members and the region. To play in a band with others is, seemingly primarily, to work together to make music, and spread a love of music to those we meet. The band's motto is, after all, "For the Enjoyment of Music". But perhaps more importantly, playing in a band brings you closer to your fellow bandmates, and has you working together to build something larger than yourselves: a community. The way the band members rally to set up or take down concerts, and the way the greater community shows up to enjoy concerts for literally a hundred years, shows how tightly knit the community is.

The point of this story is to express a newly held opinion of mine: for some people, being a part of something and building community is integral to their well-being. Some people do this in different ways: some through music, some through theatre, some through writing, some through mathematics, some through sports, and still others through other various things. For me, it's music, and being a part of a band that has fun and provides a service to the community.

For now, you may be reading this and saying that you have all the community you need right here. And that might be true; UW Math has a fantastic community. We're all here together, and we stick together. But when you're done your degree and you move on, all of a sudden that community is gone; what

happens then? You have to move on, and you have to find a new sense of community for yourself. I strongly encourage you to work towards finding a sense of community; humans are mostly social creatures, and sharing our experiences, our joy, our love, our lives, is how many of us feel like we belong in this world.

A new friend I met, as she was saying goodbye to our director after the picnic, put it this way (or close to it; paraphrased a bit), after not playing trumpet for seventeen years: "Thank you for giving me a piece of myself back." That's what community does: it helps to make you whole. And that's something worth finding.

Scythe Marshall

YOU SHOULD READ TED CHIANG'S "STORIES OF YOUR LIFE AND OTHERS"

There is almost literally nothing left to say after the title. This is a science fiction short story collection, and Chiang packs its eight stories full of new ways to see old or familiar concepts. I refuse to spoil anything; just go read it, if you haven't already. You won't be disappointed (I hope).

Scythe Marshall

A HAIKU

Procrastination

Will turn what could be good, bad

Dissatisfaction

Some Guy

EDITOR FINDS THAT MAKING REALLY LONG TITLES IS A GREAT WAY TO FILL SPACE AND MAKE LAYOUT EASIER

Long titles fill space nicely. See this article for proof. QED.

undecidED

MATH FACULTY: TEACH THE CONTROVERSY

There has been a growing movement among the populace in recent years towards numerology. Perhaps it's nostalgia for simpler times, or maybe it is a yearning born from the vacuum left by the disillusionment with organized religion. Yet all sorts of activities such as divination and numerology are flourishing in contemporary society.

There are those that want to make it a point to have all ideas considered valid and equally meritorious. Thus many are calling on secondary schools and public institutions of higher education to introduce numerology alongside traditional math curriculum as well as creationism ("intelligent design") alongside evolution in science classes.

Those steeped in rationalism and scientific inquiry will naturally be aghast at such suggestions. To them this would merely confirm the degeneracy and moral relativism of today's fact-challenged culture. Not only that, but such superstitions hearken back to the dark ages and would cause a general regression in society.

Yet it is precisely this sort of push-back that causes groups advocating alternative teachings to feel marginalized and develop persecution complexes. Thus they become ever more radicalized and intransigent. This causes a society to balkanize and split into groups that no longer communicate or associate with one another. Needless to say this is not an inviting scenario.

As an alternative, if there is sufficient demand for such alternative teachings within a given student body, why not teach them within their own classes and let the end result speak for itself? If as the rationalists say that those taught such ideas will be grossly mislead and woefully unprepared for the job market of modern society then let this play out and have their outcomes documented for all to see.

While at first this notion of teaching alternative pseudo-scientific theories may seem outlandish, it wouldn't have to end badly. To those marginalized groups entertaining persecution complexes, teaching this controversy would lend credence against the idea that modern society is rigid and inflexible. Rather than fracturing society this would bring it together. At the same time those parents and their students who self select into these alternative classes will likely not have a positive outcome regarding their education and job prospects post graduation.

This reinforcing loop would naturally pressure such communities from enrolling into these sorts of classes if they wish to thrive, leading to a self healing mechanism whereby these classes would be shunned from within. This is the best outcome for the rationalists since societal pressure would not be wielded to compel these sorts of communities externally, leading to push-back, rather these communities would be intrinsically motivated to seek better scientifically grounded education, thus their drive for alternative education would naturally peter out on it's own.

PIETHAGORUS

ECHOING APARTMENTS

Four years I've spent in university, and five in Waterloo. Each time I've needed to move, I've done it the university way. That age-old student practice of stuffing your things into bags, milk crates (that you stole from the super market), and suitcases. Stuffing those containers into your (friend's) car (let's be honest, you don't have the money to afford a car of your own), and driving it all across town to your new apartment. (Then buying said friend dinner or giving them gas money in thanks for being your chauffeur for the 6th time.) This being Waterloo, we get to do this nearly every four months depending on if we're in co-op or not. But it's become routine for most of us.

This time is the first time that this hasn't been the case. Thanks to a new job in a new city at a big company, they paid for a moving company to come and take all of our things. ALL OF OUR THINGS. I'm talking about everything from water bottles and cups, to the bed and shelves. My apartment is bare from its cupboards and closets, to its walls and floors. I'm sitting here writing this on the one piece of furniture I have left: the futon that I'm giving back to my co-worker tomorrow afternoon. I'm looking at my bike (it'll be donated tomorrow), my pillow and blanket (borrowed from a friend), and the two suitcases that will accompany me on my journey to new places this summer. I CAN HEAR MY TYPING ECHO in my apartment.

Apartments are fickle things. They come in all shapes and sizes, with varying levels of comfort, but you can mask most of that once you have more of your things in it. They become yours as you spread your stuff throughout. Mine always end up with posters on the walls within the first few hours that I move in, and a mess on the floor as I start to organize my life yet again. But now all of the comfy top level has been stripped bare. The walls are back to their ugly taupe colour, and the sounds I make while I type are uninterrupted by anything. I'm slowly going mad; if I wasn't leaving tomorrow, I would lose my mind.

What I'm trying to say is that if you ever move with the help of a moving company, have them come the day before you leave, or else stay somewhere else once they've taken your things so that you don't have to gaze upon the plain, lonely walls that were so recently filled with personality and fun.

GBAD

DISTRIBUTIONS
A CORRECT WAY TO THINK ABOUT THE DIRAC DELTA

In our differential equations courses, we learn about the "Dirac delta function", a symbol that is explicitly not a function but which we write as one, and we use it to model impulses. In particular, the Laplace transform allows us to solve DEs where there are impulse forcing terms; we utilize the so-called "sifting property" of the Dirac delta, where if we multiply a function by the Dirac delta and integrate over all of R^n, we pick out the function's value at whatever point the Dirac delta is centered. This gives us a nicely behaved right-hand-side, and we proceed with the usual Laplace transform method.

However, it's not particularly mathematically rigorous to call the Dirac delta a "function", because specifying that delta_a is 0 for t not equal to a, and infinity when t is equal to a, and saying that it integrates to 1 doesn't exactly define an honest-to-goodness function. So, what is it?

(From a measure-theoretic perspective, it's simple just to consider the Dirac delta as a point mass measure. However, we will look at a function-based perspective, and see what we come up with.)

In nature, we often simply care about smooth functions on R^n (for some positive integer n), those with continuous (partial) derivatives of all orders. Let us further consider those smooth functions which are compactly supported; that is, where they take non-zero values only on some (closed and) bounded set. Call this set of functions D. We can talk about convergence of a sequence of functions in D by requiring the sequence and a potential limit function to have a common compact support, and requiring all of the derivatives to converge in the supremum norm (that is, eventually all values of the functions are uniformly close together). D is a topological vector space.

We call the "space of distributions" the set of continuous and linear functions on D, and denote it D' (D-prime; it's notational convention to use a prime here). For an example or two (or infinitely many), consider a bounded and measurable function f. Define the function F : D -> R by setting, for g in D, F(g) to be the integral of f times g over all of R^n. By familiar properties of integration, F is a distribution! We can think of this as though f is telling us locally how much to weight different parts of R^n, i.e. how the weight is distributed. F and f are somewhat interchangeable, here, in terms of notation.

Note also that the Dirac delta can be thought of as a distribution, by saying that delta_a(g) is g(a). It's easy to see that this is continuous, and linear! So delta_a lives in D'. In terms of how points in R^n are weighted under delta_a, we see that all of the weight is given to a, and no weight is given to any other point. (This coincides with the point-mass measure point of view.)

Furthermore, we can talk about distributional derivatives. If f is a bounded, measurable, and (almost-everywhere)

differentiable function, and g is a function in D, then by integration by parts, we see that the integral of f' times g equals the integral of f times -g', since g and g' have compact support. Given a general bounded and measurable function, if there exists a function h such that the integral of h times g equals the integral of f times -g', then h is called the weak derivative of f, since it satisfies the same integration by parts formula that an honest derivative would.

We can then simply define the derivative of a distribution F to be the distribution F' that takes in g and spits out F(-g'). For one last example, consider the so-called Heaviside function H(t), the function that is 0 for all negative t and 1 for all non-negative t. It gives rise to a distribution, because it is bounded and measurable. What is its distributional derivative? Well, an easy integration by parts calculation reveals that the distribution H' is exactly delta_0! So in this way, the Dirac delta is simply the distributional derivative of the Heaviside function, which makes intuitive sense (there's a jump at 0, which one could reason informally to have infinite slope).

Coming all the way back to solving DEs with the Laplace transform, we can think of the procedure in this way. The equation has an unknown function and its derivatives on the left, and forcing functions on the right. We will assume that the functions on the left are assumed to be mostly smooth; in particular, that they are uniformly bounded on compact sets. Then the left side defines an unknown distribution! So instead of thinking of a DE like an equality of functions, we think of it as an equality of distributions! In general, we consider these distribution as on [0,inf) instead of all of R, since we care about initial value problems with initial conditions at 0.

Then, instead of thinking of the Laplace transform as integrating functions multiplied by e^(-st), we are really just evaluating the distributions at the functions e^(-st)! Technically, these functions don't live in D, but they do live in what's called the Schwarz space, denoted S, which is a closure of D under a family of particular semi-norms. Distributions are called tempered if they extend as functions to S (uniquely, by density of D in S). Not all distributions are tempered, but we can look for tempered solutions to the DE anyway. We rearrange and solve for a function in terms of s, and find a distribution that yields this particular function. It turns out that applying distributions to e^(-st) has some injectivity properties, and so there is a (mostly) unique distribution that solves this equation. For example, considering the equation x'(t) = delta_1(t) with x(0) = 0, performing this procedure yields X(s) = e^(-s)/s, and a distribution which yields that transform is x(t) = H(t-1), the Heaviside function from above translated by 1. Hence the solution to the equation is exactly that x(t) (which matches our distributional derivative calculation from earlier).

So there you go! This is a way to understand the Dirac delta, and by extension the Laplace transform, in terms of something slightly more sophisticated than what we usually see in second- and third-year courses, but still reasonable, I think. This places the Laplace transform method on a much

more rigorous footing, and hopefully allows one to avoid thinking of it as simply "magic", as many of us do.

SCYTHE MARSHALL

TOUR GUIDE: HELL

When Susie Q told me to pack my shirts and go to Hell, she didn't mean well. After all, I think our relationship was coming to an impasse. Saddened, I booked a ticket with Valhalla Airways to Hell (this was in 2004), and this trip completely changed my life.

Forget everything you know about Hell. Once we landed at Inferno International Airport, I was expecting lava ground, spikes with heads and tiki torches. Instead, it looked like the state of Missouri, but with better infrastructure. When I told my expectations to the friendly German immigration officer, she laughed and said that she sees this reaction all the time, yet it still makes her laugh.

Once she reviewed my papers, she realized that I was visiting to write an article about Hell, and immediately directed me towards public relations department of the immigration office. There, within 20 minutes they had issued me a press pass and a 3-month visitor's visa. They warned me that if I chose to stay, I'd have to complete an online request form and meet them again to discuss my permanent residence options. Speechless, I took a cab from the airport. The cab driver was a friendly Azerbaijani driver, who had a debit machine, accepted Russian roubles, American dollars and euro. Other currency is a bit problematic in day-to-day interactions, but you can still easily convert it in the currency exchange stops, or at the banks (exchanges have better rates and banks will remind you of this).

The cab from Airport to the Pandemonium city (capital of Hell) cost $6.66 and once I arrived, I was stunned by the beauty of the vision that unfolded before me. An industrial city, it had a magnificent statue of man holding the globe in the central square, with fountains around. As I walked past the Genghis Khan boulevard into the esplanade, I saw men and women rushing to work. No signs of torture, no signs of unspeakable horrors.

For my day 1, I decided to avoid tourism agencies and earn an authentic visiting experience. I went to the Swiss bank and checked the rates. It is important to know the rates and not be scammed first. Then I saw a friendly British police officer, sitting on a bench in the park and enjoying his doughnuts and coffee. I sat nearby and took out my phone, trying to google the nearest bus station, but alas Telus didn't work there. I recommend a roaming plan, or you may choose to get a local phone company sim cards. The officer wasn't on duty, and amused by my inability to adapt to the fact that my phone wasn't working. He offered me help and gave me directions before he asked about my stereotypes of Hell and walked me through my cultural shock.

Torture is illegal in Hell. Only 80 out of every 100.000 citizens of Hell's population are incarcerated, which makes it slightly worse than Norway, but better than Switzerland. Crime rates are very low, but it isn't nonexistent either. The harshest prison term is capped at 20 years, and state provides prisoners with job security after release. There are also facilities for mentally disabled people, but those vastly differ from prisons, and are more like hospitals and universities.

People have rights to own firearms, but owning ammunition is illegal, and it must be stored in the special armories. It is hard to get concealed carry permit for a gun, unless you are in witness protection program, but getting a license to carry a sword is easier.

Voting rights for every citizen were granted in 1842, regardless of gender, race or religion. You can vote starting from the age of 20. Ban on religion stopped in 1805, and in 1807 first churches, mosques and synagogues were permitted for construction. Gay marriage was permitted in 1610 Equal Marriage Act. Conscription is not mandatory, although Hell has a standing army. Rapidly industrialized, the ecological problems increased Hell's carbon footprint. But Hell's senate is sure that the Environmental Conservation Act of 1998 will change things for the best, mitigating the effects of global warming.

AUGUST MARAUDER

A COUNTDOWN TO THE END OF EXAMS

14 days until exams end.
13, because an unlucky number just feels appropriate for exam season.
12 straight hours of studying.
11 dollars/hour doesn't look so bad after all.
10 nightmares about failing.
9 times you considered dropping out.
8 geese you tried to provoke in an attempt to avoid exams.
7 coffees per day.
6 new places you found to sleep on campus.
5 all-nighters.
4 hours of sleep.
3 mental breakdowns.
2 times you read **mathNEWS** when you should have been studying.
1 ring to rule them all.

Hang in there, mathies. Just a couple more weeks of school to get through, and then you get a couple weeks to just chill before you start your next school or co-op term. You can do it! Woo! Motivation!

AN UNNAMED EDITOR TRYING TO FILL SPACE

HIT ME ONE MORE TIME OVERWATCH

TO THE TUNE OF HIT ME BABY ONE MORE TIME (BRITNEY SPEARS)

Oh, Tracer baby,
How was I supposed to know
This game was so addictive?
Oh, Sombra, baby,
Your hacking's the way to go
But cooldowns are restrictive

Show me how to kill the Mercy
So she can't rez,
'Cause I want to get play of the game

Genji's deflect
Keeps killing me and I
I'm getting wrecked
Fuck this McCree. Damn flashbang!
When we're not grouped we die one by one
Is this match done?
Why'd I think this game is fun?

Oh, Torby, with you
I'll sure get play of the game
Damn, their Pharah is good
I'll switch to Reaper,
And try to grab all of the fame
But I did all I could

Show me how to kill the Mercy
So she can't rez,
'Cause I want to get play of the game

Genji's deflect
Keeps killing me and I
I'm getting wrecked
Fuck this McCree. Damn flashbang!
When we're not grouped we die one by one
Is this match done?
Why'd I think this game is fun?

Oh, Hanzo, baby
Oh, Widow baby
Snipers, yeah

I'll just go sniper,
And show how I am the top
"Too many snipers",
I won't be the one to swap

I'm getting wrecked!
This can't be correct
Who's killing me now?
What the fuck it's still McCree?
Where is the healer?
"I need healing" now!
Once my ult's up, they'll go down!

Genji's deflect
Keeps killing me and I
I'm getting wrecked
Fuck this McCree. Damn flashbang!
When we're not grouped we die one by one
Is this match done?
Why'd I think this game is fun?

Yours in watching over,
Shay Blair

A NOTE TO THOSE WHO ARE LEAVING mathNEWS

First of all, thank you. Thank you for all the articles and the humour. I have been reading your articles since before I started writing for **mathNEWS**. Writers like you are the reason I joined this crazy "newspaper". It has been wonderful getting to know you at production nights and EOTs, and you will be missed in future terms.

Good luck in the future. I hope your lives are full of things just as enjoyable as **mathNEWS** (That's probably not possible but good luck anyway).

undecidED

N THINGS TO DO WHEN YOU'RE DONE EXAMS

- Sleep

- Make it through an entire day without caffeine

- Realize that caffeine is an exception to the "i before e, except after c rule"

- Start writing your **mathNEWS** articles for next term!

- Catch up on all those shows you started watching back when you still had free time

- Actively avoid thinking about anything school-related

- Contact all the friends you've been ignoring for the last 4 months

- Take a vacation

- Fake your own death and move to Mexico

TheUndecided

INVESTIGATIVE JOURNALISM! IS "DESPACITO" BY LUIS FONZI & DADDY YANKEE FT. JUSTIN BIEBER AN ATTEMPT TO RESURRECT AN ANCIENT GOD?

That's when I- Wait! Are we on?

Oh, good.

Greetings Reader. It is I, Theodore Bear, and I notice that look on your face longing for my unique and personal brand of investigative journalism. Well, the wait is over. Now, it's time for some good old fashioned investigative journalism, or to be more specific, some good old fashioned music journalism.

The song "Despacito" by Luis Fonzi & Daddy Yankee ft. Justin Bieber is the hit of the summer, becoming as prevalent and enduring as the hot summer heat. Strangely enough, I didn't end up hearing the song until just a little while ago, partially due to the fact that my residence this semester was located underneath the Egg Fountain outside MC. Because of the influence of the occult on the music charts, I immediately found its popularity intriguing and perhaps a bit worrying, and so I started looking into the song. I also realized that it would be fitting for the first and last issue of this volume of **mathNEWS** to have an article inside about the song.

The song has also gained some fame from the fact that it is one of the most popular songs now while also being sung predominately in another language. This language is one that many of its listeners do not understand, which is probably why it was able to become so popular with a message most people would find abhorrent. Its listeners probably believe the majority of the song is written and sung in Spanish, but truth goes far deeper.

While the lyrics translate into a fairly typical love song when translating from what we now know as Spanish, the lyrics can also be read as ancient Sumerian and Babylonian. The connection is not easy to see for most people, but thankfully I am fluent in 238 languages (one of the main reasons I was hired by the University of Waterloo Department of Mystery). Translating the lyrics then running them through Hellman's cryptographic code, calibrated with the correct number of singers for each line, reveals the song's true, secret purpose.

The lyrics end up talking about a great portal and the return of what they call "The Ancient One". From my research, I believe they are referring to "Misgorath", the ancient Sumerian god of death, who's return shall rain death and pestilence upon the world. The first verse, by Fons and Yankee, goes into incredible detail on the topic of virgin sacrifice. The second, by Yankee alone, extols the virtues of watching your entire family, and the third, by Fonsi alone, has him begging "The Ancient One" to come to him and bring humanity into the dark world. The bridges describe the ancient ritual which the singers then say that they perform in the 7 seconds. The chorus seems to be some sort of ancient tribal chant who's meaning would be lost to those who don't understand the languages they are written in. Who knew that such a catchy song could have such a dark message?

The song has an energy to it, especially in the chorus, going to the very end... Wait a minute! I thought this song was by Universal Music Group, not Universal Music Latino. I need to redo my calculations.

Let's see... take out the UMG matrix... multiply by Freeman's constant...

Holy shit! This changes everything!

<div align="right">

Theodore Bear

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INVESTIGATIVE JOURNALISM! IS "DESPICITO" A RITUAL TO RETURN JUSTIN BIEBER TO THE CRYSTAL PRISON FROM WHENCE HE CAME?

It turns out that I was wrong. The song actually wasn't trying to resurrect some ancient god. As it turns out, Luis Fonsi and Daddy Yankee weren't trying to destroy the world, but instead, were trying to save it. The lyrics, after being run through Hellman's algorithm, tell a different story. Instead of talking about releasing "The Ancient One" using the a great portal, the lyrics actually translate into a set of instructions to trapping a great evil inside another dimension.

No doubt the entity they refer to is Bieber. You may be wondering, how is Bieber a great evil. Well, in occult circles, he is known for entrancing his followers into committing ritualistic suicides using forbidden herbs. And that's just taking into account his behaviour in the modern day. The legends of ancient civilizations also speak of a young man named "Ieber", who came to their cities and corrupted them until they fell into ruin. He transformed paradises into hellish landscapes of death and destruction. Yes, the evidence is pretty clear. The singer we know as "Justin Bieber" is in fact an ancient being from before time itself that seeks to end civilization and lay waste to everything we hold dear.

Perhaps Luis Fonsi and Daddy Yankee realized that the world could not continue with this evil roaming inside it, and decided to spring a trap in order to banish Bieber to Crystal Prison from whence he came thousands of years ago. This mission of theirs would have had to be planned for years, perhaps since their very births. While official records disagree, as they often do when it comes to secret societies, I have a source who has told me that Fonsi and Yankee were raised together in a monastery deep inside the Amazon rainforest by an order of monks dedicated to wiping out the Ancient Evil. I in fact managed to visit that monastery during my work term, when I visited the Amazon. The two of them, once they were allowed to leave their isolated shelter and visit the outside world, immediately started preparing their grand plan. After managing to secure fame in the recording industry, they proceeded to ask Bieber to collaborate with them.

However, this was a trap. Bieber likely wouldn't have realized that the lyrics of the song he was singing was actually a spell to banish him to Crystal Prison from whence he came. He must have had no idea that as he sung the catchy chorus, he was bringing about his own doom. A powerful being such as Bieber, responsible for the death of millions, would have grown overconfident in his old age, not realizing that people would still attempt to stand up to him. Rituals such as these often require the powerful being to perform some kind of action of their own free will as part of the spell. If I would guess, Bieber's singing of the out-of-place intro, a powerful spell, was that action, and ended up sealing his fate. His own hubris of accepting the collaboration, believing himself to be on top of the world, ended up causing his downfall, as hubris often does.

Did Fonsi and Yankee ritual succeed? We don't know. However, I would like to point out that, despite singing in the song, Bieber never appears in the accompanying video. Could this be a clue that Fonsi and Yankee succeeded, trapping Bieber in the Crystal Prison from whence he came after the spell completed when the song had finished recording? That would be a good reason why he didn't appear.

If they did succeed, what does that mean for the future? Likely, another reason they sent Bieber back to the Crystal Prison from whence he came was to free up space in the charts for them and other artists. In that case, it will be a while before we see Bieber back on the charts. It will occur when the full moons align and an artist so desperate for a collaboration that they'd turn to the occult (believe me, it happens quite often) travels to the ancient lands beyond the tallest hills and releases Bieber from his crystalline slumber with promise of a Top 40 hit. Only then will Bieber be released from the Crystal Prison from whence he came, and bring havoc to the world once more.

But until then, I have nothing more to report on this story. This has been some investigative journalism, served directly to you by the one and only Theodore Bear.

THEODORE BEAR

DO YOU HEAR THE MOUNTIES SING?

TO THE TUNE OF DO YOU HEAR THE PEOPLE SING FROM LES MISERABLES

Do you hear the Mounties sing?
Singing a song across the plains
Canada's story of a brave group
Who enforce our dear Queen's reign!
When the beating of the hooves
Chases the crooks as they disband
You know the Mounties will be there
And they'll get their man!

Will you watch as we ride past?
We are the strong RCMP
We'll do as we are asked
And more, use thank you and use please.

We fight and we'll ride
Until all have the right to be free!

Do you hear the Mounties sing?
Singing a song across the plains
Canada's story of a brave group
Who enforce our dear Queen's reign!
When the beating of the hooves
Chases the crooks as they disband
You know the Mounties will be there
And they'll get their man!

We will wear red coats with pride
And Stetsons proud upon our heads
We will speak French as we ride
Upon a moose or a dogsled.
The strength of the Mounties
Will echo throughout Canada!

Do you hear the Mounties sing?
Singing a song across the plains
Canada's story of a brave group
Who enforce our dear Queen's reign!
When the beating of the hooves
Chases the crooks as they disband
You know the Mounties will be there
And they'll get their man!

YOURS IN MOUNTING,
SHAY BLAIR

lookAHEAD

SUN 30	MON 31	TUE 1	WED 2	THU 3	FRI 4	SAT 5
	Exam Period	Exam Period	Exam Period	Exam Period	Exam Period	Exam Period

SUN 6	MON 7	TUE 8	WED 9	THU 10	FRI 11	SAT 12
Friendship Day	Exam Period	Exam Period	Exam Period	Exam Period	Exam Period	

ARTICLE OF THE ISSUE

This issue, we're trying something new. We've been handing out articles of the issue for far too long. Instead, I'm going to award some other[1] accolades. Because they're still in beta, they don't have any physical rewards attached, whether monetary or otherwise. I hope our authors understand.

To Theodore Bear, I give the award of 'Most Times Justin Bieber Mentioned In An Article'. The name Justin Bieber occurs an impressive 14 times in his article "Investigative Journalism! Is "Despacito" a Ritual to Return Justin Bieber to the Crystal Prison From Whence He Came?" and there's a fifteenth if you count the title.

To E-Unit, I give the "Uncomfortable Accuracy" award, for your uncomfortably accurate article.

To Diminutive Rex, Sky Blue and Farting Pony, I give the award of "How Did You Get In The **mastHEAD** Without Writing An Article", which I believe is both suspicious and self-explanatory.

To DF I give the "You Included A Bee In The Cover Design And This Pleases Me" award. Actually, I'm also going to give DF the "Cover Of The Issue" award, because you're worth it.

To Scythe Marshall and Shay Blair (and Hat Of Chocolate), I give the "Wow, You Graduated, Congratulations On Being Free Of The Clutches Of This Unholy Publication" award, but I give it to them reluctantly because they have escaped and I have not.

To August Maurader, I give the "Lying Liar" award because Telus works in the bottom floor of RCH and that's as close to Hell as you can get, I figure.

To Piethagorus, I give the "Savoury Username" award, because I am hungry; to GBAD, I give the "Why Did You Live In A Taupe Apartment" Participation button.

TBDED

1. For example: $s, t \in \{2k | k \in Z\}$, 144; you get the Footnote King award.

Just so you know, anyone can write a '[person x]SEZ article and we will treat it with the proper respect a SEZ article deserves. Because you're worth it.

EASY BREEZY
math**NEWS EDITOR**