



## LOOKAHEAD

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### mathNEWS

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May 27	Issue 2 falls down a cliff and tries to climb its way back up
June 6	Writers gather in the shadows for Production Night
June 10	Issue 3 shows off a fancy new skin

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### MathSoc

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June 2, June 9 Games Nights

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### University

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June 8 Final exam schedule posted

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### Miscellaneous

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June 3	National Doughnut Day
June 4	Hug Your Cat Day
June 6	Ramadan begins
June 19	Father's Day

## VPO SEZ

Hi Mathies!

It's me, your MathSoc VP Operations. Here are a few quick updates on the state of the MathSoc Office.

- Office staff have been hired. Going forward, the office should be mostly open 9AM–5PM weekdays.
- The budget has been approved, and candy has been ordered.

If you have any questions or suggestions this term, please email me at [vpo@mathsoc.uwaterloo.ca](mailto:vpo@mathsoc.uwaterloo.ca).

*Simon, MathSoc VPO*

## MASTHEAD

My presence at the University this semester has been very sparse, partially due to my taking only one course this semester. I do have a particularly good excuse for last week, however; I was in bed due to a fever and a bad cough. My throat still hurts and I still have coughing fits, but at least I can kind of talk. Not that it matters, since I do not partake in this "talking" business all that often. For this week, at least, that in itself was apparently worth talking about, and we asked our writers, "How would you speak with a man who has nothing to say?"

Dusk Eagle("I have nothing to say."); Lost in New York("....."); Beyond Meta("ME: What are you passionate about? MAN: ... ME: walk away slowly"); DiminutiveRex("I'd give him a teleprompter"); Shay Blair("Ask him questions where saying nothing is incriminating."); Zethar("Telepathically. Duh."); TheUndecided("Just talk about myself because I'm probably more interesting anyway."); Ender Dragon("Jab him in the side. That'll make him say 'ow!'"); Scythe Marshall("There exists a man who has nothing to say?"); *bunniED("I probably wouldn't and instead would just sit with them awkwardly.")*.

## WRITE FOR MATHNEWS!

**Who:** Mathies, non-mathies, and literally anyone who likes to write stuff.

**What:** Writing for *mathNEWS*, the best (and only) newspaper produced within UWaterloo's Faculty of Mathematics.

**When:** Production nights are (usually) every other Monday evening from 6:30 to 9:30 PM, but you can write

whenever you want. Feel free to let *mathNEWS* take over your entire life! We don't care! That means more articles for us!

**Where:** Your desk, your bathtub, your roof, wherever your creative juices flow. Alternatively, show up to the MathSoc Office (MC 3038) for production nights.

**Why:** Because you can meet new people, and because we like to have content to publish. Also, most importantly, you get free pizza if you show up at production nights.

**How:** Come to a production night to learn how to use WordPress, or submit your articles to [mathnews@gmail.com](mailto:mathnews@gmail.com).

*TheUndecided*

## ERRATA: BREAKING TRISCUIT NEWS

Last issue, a photograph was included in an article discussing the new Smoked Gouda Triscuits. The photograph was of the American box; the Canadian box looks different. Google Images doesn't think that this box style exists. Fuck you, Google Images. Moreover, the picture I took of the box at the time was not a very good photo, so that's unusable.

It's like I'm not doing a good job of convincing you that they actually exist. Instead, check out your local grocery store; they'll be there. I hope.

*Scythe Marshall*

## HEY CLUBS AND MATHSOC EXECS! YOU SHOULD SUBMIT A SEZ OR TELL US WHEN YOUR EVENTS ARE! ... PRETTY PLEASE?

## THE MANS PROJECT

As part of the new announcements being made about Pokémon Sun and Moon, I did a project to draw some of the new Pokémon from descriptions that people gave me, without actually having seen what they looked like themselves.

This was pretty hard to do, as they appeared both covers of last issue, but I managed to do three pictures of each anyway without peeking.

I'd like to show you one of them in particular.

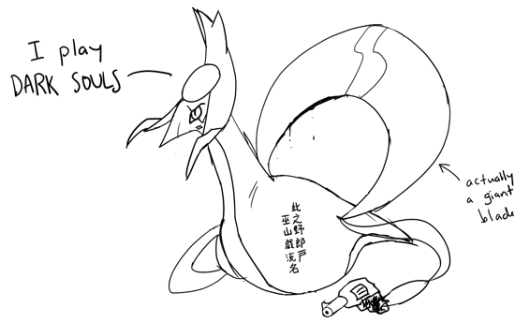
"It's Cresselia, but it looks a lot more edgy, it has headgear that sorta resembles what LadyDevimon has, and its wings are made of space."

LadyDevimon, for those who aren't familiar, is a Digimon. So this already didn't bode well for the description I was about to draw.

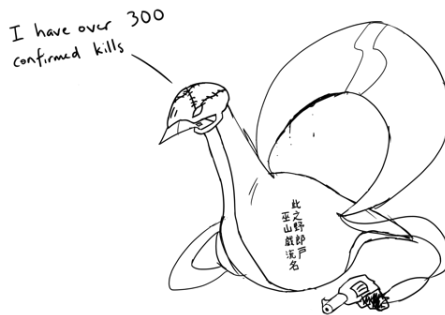
Let's start with Cresselia:



make it "look more edgy", whatever that means:



give it LadyDevimon's headgear (look it up):



and finally, give it wings made out of space (which I just took to mean blank transparent wings because I had no idea how to interpret it):



Mwah! Masterpiece!

Now let's compare it to the real thing:



Ehh, close enough.

*Ender Dragon*

## N REASONS WHY SUNGLASSES ARE GREAT

- They make you look badass
- They protect you from being blinded
- They prevent eye cancer
- They are useful for hiding tears, which also helps with looking badass
- They make you better at poker
- If you are sufficiently badass (and since you are wearing sunglasses, you probably are), you can use them as a projectile
- You can use them to PUNctuate bad awesome puns

*Beyond Meta*

## BELATED MUSICAL RE- VIEW: HAMILTON

A REVIEW OF THE MUSICAL  
BY LIN-MANUEL MIRANDA

This past Sunday, I experienced *Hamilton*, a musical about the life of Alexander Hamilton, one of the Founding Fathers of the United States of America. No, I did not get tickets to see it live; I wish. But I purchased the soundtrack, so that's close enough. Right? Right. Moving on. (Yes, I know, I still buy music. Call me old-fashioned, or just "old".)

The musical originated around 2008 as *The Hamilton Mixtape*; Miranda conceived the concept upon reading a biography of Hamilton, and realizing that the "bastard, orphan, son of a whore and a Scotsman" was as real an embodiment of hip-hop as anyone could be. Hamilton's personality and temperament (and actions) lend themselves well to Miranda's interpretation. The musical debuted off-Broadway in early 2015, and soon made its way to Broadway later that year, becoming a smash hit. Why, exactly, is it so critically acclaimed? Well, let us explore.

The music featured in the show utilizes a large number of genres. The opening number, "Alexander Hamilton", features both rap and sung vocals, and the backing instrumentation goes from sparse chords and snapping to full strings with a dramatic climax. Other songs feature a more traditional Broadway pop sound: "You'll Be Back", sung by King George III about the possibility of the US declaring independence from Britain, is one of these more straightforward but catchier-than-hell tunes. Some

songs are actual rap battles: "Cabinet Battle #1"/"#2" are both written this way, and are, perhaps surprisingly, poignant illustrations of how these scenarios probably went. All of the songs draw out the correct emotions for the scene, and keep you on edge with repeated motifs and themes according to dialogue and character. The callbacks from song to song are very fitting.

The lyrics are somehow even more engaging. Miranda's writing is top-notch; the witticisms and rhymes flow smoothly and effortlessly, and even if they can sometimes be a mouthful, the performers nail them each and every time quite clearly. There are many lines in the show which will stick with you, like, "Why do you write like you're running out of time?" Very rarely is a character given spoken lines which are meaningless; it all matters.

The non-musical portion of the show has also received good commentary. The set, props, and choreo are all interesting and appropriate for both the situation of the musical (late 1700s) and for the musical style (modern pop/hip-hop), thus demonstrating a juxtaposition that works very well.

With regards to social justice (because this is actually important!), the casting for the show features an important note: all characters (with the exception of the King of England) are portrayed by people of colour. Miranda intended for this to demonstrate that America looks a lot different than it did two hundred years ago. Some have criticized this casting, saying that it obscures the fact that people of colour had no power at that time. Miranda has also commented that the many of the roles of the show should be playable by women. Meanwhile, there are only

a few female characters who feature prominently in the musical, two of them are sisters, and they only really act as love interests for Hamilton, in order to further illuminate his story. In this sense, the as-written cast for the show is not terribly diverse (the show doesn't pass the Bechdel test, etc., etc.). This can mostly be blamed on the time period, but this should not set an example for how musicals should be written in the future. The musical also does not address other unfortunate aspects of revolutionary America, which serves, if not to glorify the "old ways", then to passively allow them to continue. Or something.

It should be noted, but not taken too seriously, that Miranda does not stick to absolute fact in his description of certain events. Burr's relation to Hamilton is in places overstated, and sometimes characters are doing things which they did not do in real life. For the casual fan, however, this does not pose a problem, and for the history buff, the inaccuracies are tolerable, as they allow the story to move along without needing to introduce more minor characters and continue to build tension between the characters we already know. It's also very important to note that *Hamilton* is approximately three hours long in two acts, one an hour and a half long, and the other an hour and fifteen minutes. It is a long show. It makes sense, but it is a fact that the show cannot escape.

*Hamilton*, regardless of various criticisms, has become a fan-favourite musical, and has spawned parodies of a couple of its songs. In particular, the opener has been parodied into "Batlexander Manilton", "Luke, the Son of Anakin", and "Hamiltrump", to name three highly-liked videos on YouTube. It's an Internet phenomenon, but

really, it's more than that. It has been used in classrooms to discuss US history, and has been used to introduce young people, especially those in disadvantaged families, to musical theatre (through support from Miranda and other organizations to subsidize ticket costs). It's a cultural phenomenon.

Perhaps the interesting thing is how American history could be so... interesting, especially to a Canadian. The quality of this musical transcends its content, in my opinion, and it's possible to learn more about how some issues, which continue to plague the United States, arose very early on in the country's history. It's an experience, which hopefully will leave you slightly more worldly than before. And if you get a chance to see the musical live? Well, you'd better not be throwing away your shot.

*Scythe Marshall*

## TAK

I was recently introduced to an abstract strategy board game created a couple of years ago called Tak. A coworker introduced me to it one afternoon during a break from work, and I was intrigued.

After playing a couple games, we came across a situation where we weren't sure about what the rules were, so afterward I decided to look them up.

The very first paragraph in the rules states "These rules describe the 'modern' version, with some references to rules variants from antiquity." This struck me as odd, because there was very clearly a "© 2015" notice on the exact same page. Still, I was trying to look up a rule, so I kept reading.

I kept reading until I got to the paragraph, "Why doesn't white move first? We randomly choose colors, and then pick a first player, because traditionally each player has his own set of stones. And since each player would play with his own pieces, it doesn't make sense to let the lighter color always move first."

That set off my bullshit meter. What if both players happened to carry around white stones? Furthermore, they'd still need a board to play on, and carrying around 21 game pieces in your pockets just hoping to run into somebody else that was also only carrying around half of the pieces required to play hardly seemed like a thing people would actually do. Plus, I was sure the game was only developed a couple of years ago...

As it turns out, the game was made in 2014–2015, and all the references to "tradition" and "nobility versus commoners" throughout the rules is just made up history. I'm a little conflicted as to how I feel about this. On the one hand, adding backstory to games is a well-established thing at this point, but this game's backstory has nothing to do with the actual "story behind the game" and just talks about how fictional people used to play the game. Coming from games like Chess and Go which have actual history behind them, this fake history feels a little cheap.

Overall though, I'd give the game a fairly solid rating. There's even an online server you can play on: <https://www.playtak.com>. If this was a normal weekend, you might even find me on the server. But Overwatch is out now, so I don't think I will ever have time to play any other game ever again.

*Dusk Eagle*

## HOW TO DODGE ACCUSATIONS

Well, look at you. You've somehow gotten your way into trouble. Now, nothing too big; maybe the cache of chalk in your backpack has been discovered; you've been found at the site of a murder; or your prize-winning fruitcake has been found to be an elaborate fake. Either way, you've been accused of something or someone is suspicious of you. You need some way to deflect suspicion and get their attention off of you without actually addressing the accusation.

Well, there is a foolproof\* way of doing so. Simply plead the 3rd amendment. Ideally, this will confuse them such that they forget what the original accusation/question was. They may ask questions such as, "Don't you mean the fifth?", "You know we're not in America, right?", or "What?" To many of these questions, you can quote the great Randall Munroe, and say "I have few principles, but I stick to them" or simply continue to insist that you plead the 3rd.

If questioned further, you can take advantage of several other useful amendments. You can start talking about how frustrating it is that you can't sue Nevada in this situation because of the 11th amendment. Talk to them about the intricacies of the presidential election procedure revisions contained in the 12th amendment.

If all else fails, plead the 16th. This should only be used as a last resort.

I plead the 21st,  
*Shay Blair*

\* If this is a lie, I plead the third.

## SWORDS IN PARLIAMENT

Last week Trudeau continued the great legacy left behind by former Liberal Prime Minister Jean Chrétien. Chrétien is famous for strangling a protester that was in his way, a move now lovably called the Shawinigan Handshake. Trudeau honoured his predecessor by elbowing an NDP MP. Many critics are disappointed by this action, as it is not nearly as violent as it could have been. Furthermore, there was no clear shot of the act. The average viewer watching this event would have deemed it to have been an accident.

This, however, is not the opinion of our honourable NDP MPs. The act was described as "physical molestation" and an example of violence against women. Given that the MP was obviously behind Trudeau, this incident has revealed the secret truth: that our Canadian Prime Minister can see from the back of his head.

Out of safety for their well-being, the NDP demanded that swords be once again permitted in parliament. Seeing the sheer of amount of damage an elbow can do, the only way to ensure the safety of MPs in the House of Commons is to equip each individual with a 70 cm long sword.

This move is to hearken back to the good old days, back to a more civilised time in which our Prime Minister was a raging alcoholic, we still had the death penalty, and we didn't have all this technology. We have no worries that this might lead to an escalation of conflict, since we expect our elected officials to always act in a levelheaded manner.

If tempers do rise, there will be some time for people to intervene as the distance between the government

and official opposition is required to be at least 3 swords' lengths in distance\*. At the very least, Parliament would become a lot more interesting to watch.

*Beyond Meta*

\*This is an actual fact.

## TOP TEN AMENDMENTS TO THE US CONSTITUTION

10. The Twenty-Sixth Amendment protects all citizens in a certain age range from being discriminated against for their age. It's okay to discriminate against citizens outside that age range, though.
9. The Tenth Amendment reinforces the principles of federalism. I dunno what that means, but I'm a fan of Hamilton and I know Alexander Hamilton was a federalist, so I figure it's probably a good thing.
8. The Fifth Amendment protects against double jeopardy, which is always the least fun part of Jeopardy.
7. I don't even care about what the Twenty-Seventh Amendment is about, but it was proposed in 1789 and then finally ratified in 1992, after some dude in Houston was like, "Hey, we should ratify this!" So that's pretty cool.
6. The Eighteenth Amendment establishes prohibition, and I think we can all agree that went really well.
5. The Twenty-Second Amendment limits the length of time a president can hold office, which in the worst-case scenario protects us against the Holy God-Emperor Trump.

4. The Eleventh Amendment protects states' rights to not be sued by foreigners. I like this because as a non-American, it actually applies to me! Also, it's summarized by the phrase rex non potestit peccare or the king can do no wrong—and I like the idea of Rex being able to do no wrong.
3. The Ninth Amendment protects all rights not covered in the Constitution, which I feel is the first step to an amendment which protects all amendments that do not protect themselves.
2. The Third Amendment says you don't have to quarter troops in your house in peace time. Given that my roommate was in the military, I assume this means I can kick him out of our house. I would have lots more room to myself!
1. The Eighth Amendment prohibits cruel and unusual punishment... so it could probably get me out of doing CS488 homework!

*Diminutive Rex*

## RITEFOURMATHNOOZ

(WRITUSFOR MATHNEWSIS)

Do you suffer from chronic boredom? Do you spend your Monday nights alone doing lame stuff like watching Netflix, gaming, or doing assignments? Have you ever experienced the urge to spew nonsense onto paper for other people to read? Talk to a *mathNEWS* writer to see if Ritefourmathnooz is right for you. Side effects of Ritefourmathnooz include an increased appetite for pizza and cookies, improved writing skills, an increase of joy in your life, and sometimes death.

*TheUndecided*

## #SLOGANSFORPOLITICIANS

BECAUSE TOTAL BIAS DOESN'T MAKE YOU GET ALONG WITH EVERYBODY (I'M LOOKING AT YOU, SUPPORTERS OF #SLOGANSFORHILLARY)

- "Nothing I did was wrong"
- Like father, like son
- "I am not Hillary"
- Make ourselves rich again
- The Pope of the 21st century
- FBI'm with her
- Technically-inept Hillary [I mean really?! Wiping the email server with a cloth or something??! [youtube.com/watch?v=9Rha6Wamfp0](https://www.youtube.com/watch?v=9Rha6Wamfp0)]
- We only want Americans to work in our country
- Fifth Amendment wimp
- Revenge of the fifth[-pleader]
- Mathematically-adept Donny

JP

## SATIRICALLY TRUMPED

I give up. It is actually impossible to satirize Donald Trump. You would think he makes an easy target, but no—adding any more absurdity makes it unbelievable. So here are some Trump facts instead:

Donald Trump blamed terrorists for the crash of EgyptAir Flight 804 the morning the crash was announced. They barely knew where the plane went missing. The important lesson here is that TERRRORISM is always to blame. That's why STAT 231 needs a higher bell-curve.

Trump did an interview with Fox News anchor Megyn Kelly, whom he has publicly retweeted being called a "bimbo". In the interview he denied ever bullying anyone and defended his actions with, "You would be amazed at the ones I don't retweet" and, "You've been called a lot worse, is that right, wouldn't you say?"

Trump has begun voicing opinions on the higher education system in America. He plans on forcing Universities to share in the risk of their students' loans. He hopes this will reduce how many students they choose to admit. He will deal with the issue of people constantly in school because they have no job prospects by not having them go to school in the first place. It's actually freaking brilliant—that way, they can take over the unskilled jobs that immigrants are doing, since they will have the necessary lack of qualifications.

Wallmonger

## THE PERILS OF RANDOMNESS

Sometimes in life, there are situations where you are called upon to come up with a random object. This might be because you want a reputation as "lyk ttly random xD" or you are trying to deliberately throw someone off by saying something unexpected. However, there is something you must avoid at all costs: becoming pseudo-random.

For example, do not fall into the trap of accidentally having a go to "random" object. If you say the same thing every time you are coming up with a random object, like "fruitcake", you will no longer be viewed as random. Here are some possible solutions:

- Have a large set of go to numbers/objects/etc. Cycle through them, ensuring you do not use the same item within 20 iterations since its last use. This, while not truly random, will give the appearance of it. For best results, sets should contain at least 1398 items.
- Accept that this is your life now. You are a poorly written random number/object/item generator function.
- Become an artificial intelligence. Write a true random computer program with your superior intelligence, and use it to generate true random numbers and items.

Yours in fruitcakes,

Shay Blair

## GEESUS'S GOOSE GUIDE

Yo dawgs, dis is da real MC Geesus here! The one and only, here to deal in the secrets of goose control.

To start out, a shout out to my bro MC Jesus. You're a real inspiration for long hair, man! You da real MVP here.

So, about dem geese. It's real simple, yo. Just don't give a fuck about them. But not actually bro—don't go running them over with your car and shit. Don't give a fuck when they frontin you, don't give a fuck if they're in your way, and especially don't give a flying fuck when they flying at you—they'll just land, man. It's all about dominance, bro.

Peace out,

Geesus

## GIRAFFE BUYS HOUSE, FORGETS TO PAY INSURANCE PREMIUM

A Waterloo giraffe is facing loss of property after neglecting to pay their insurance premium. The house in question is 282 Tabbet Private, and was on the market for a fortnight before being scooped up by the giraffe. Regional real estate laws state that an insurance premium must be paid for down payments under 20% before possession; however, the giraffe did not realize this when they made their move.

"It's as if this is assumed knowledge. The zookeepers never told me insurance premiums existed and I didn't think to ask. I consider myself a well-educated giraffe, but the educational system in the zoos has failed me. I cannot be blamed for my lack of knowledge on house purchasing," the giraffe told reporters in an interview.

Others have voiced concerns that the realtor involved did not make sure their client had a thorough understanding of what was required of them.

"It's hard to know if a giraffe understands you," one realtor commented.

Animal rights groups are using this incident to push for drastic changes in the quality of education available for giraffes.

The University of Waterloo has jumped into the media storm to advertise courses that help giraffes just like this one. "The Centre for Career Action offers many courses dedicated to helping animals that have just joined society and might need a few helpful tips," the University President, Hamdullahpur, said.

This is not the first time educational reform for animals has been in the media. During a Question Period

in September 2015, Stephen Harper fielded a question on this matter. "Obviously, the education of our animals is crucial to the success of the Canadian economy. No giraffes should feel they don't have the ability to integrate as fully-functioning members of Canadian society. In the past fiscal year, under the Conservative party, the number of animals holding major government positions has increased by 10%. Obviously, we are heading toward smoothly integrating animals into society on all levels..."

The Liberal Party has not taken an official stance on the Conservatives' animal-integration plan.

This is just one event in a string of many that have been cropping up lately. Last week, we heard from a giraffe in Brampton whose credit cards were frozen after a mistake in local Credit Unions brought all giraffe credit limits down to five hundred dollars. "I went out to buy a bag of multi-leaves for the kids at Safeway, but my credit card would not go through."

It is in instances like this that we are reminded that giraffes face the same sort of struggles as the rest of us.

"I don't want to lose my home," comments the giraffe.

*ET*

## INSANITY

We hear about it in court dramas as a defense ploy and read about it in cheeky comics about the scientific method, but how relevant is it? With the advent of numerous specific mental illness classifications and a historical stigma against the the word, "insanity" has fallen out of common use.

In order to bring insanity back, we need to make a concerted effort to be very specifically insane. A good

place to start is Florida. Something about the sunshine state really brings out the Floridamans and Floridawomans in people.

Getting to Florida is easy. First, book a flight to anywhere in the US (I hear Detroit is cheap). Then fake a leg injury at Pearson to get a wheelchair and have the staff roll you to any gate in the terminal. Proceed to tell everyone you see how your wonderful grandson Jimmy bought you a timeshare beach condo, but you are worried about the sun and only brought SPF 80 sunscreen, but it is okay because your friend Bertha has been going down for years and her thyroid is doing great now, etc. Somewhere around the third run-on sentence, nobody will believe you are under 70, regardless of how young you look.

When the early boarding announcement comes for a Florida flight, have the victim of your spiel roll you to the end of the long line of wheelchair-bound elderly. Then steal the ticket and passport of whomever is next to you. Gender does not matter; we are a progressive society. In a matter of minutes, you will find yourself seated, buckled, and bound for sunshine.

Only one step remains: the title. Once in Florida, live out your days under the assumed identity of the same elderly person. When you are arrested, rip off all your clothes and run around a bit. Maybe poop on something. Just request a newspaper in prison to receive your certified Floridaman™ degree in print.

Congratulations! You are now insane!

*FloridaMan*

**MATHNEWS.UWATERLOO.CA!!!**



## ON SENDING SECRET MESSAGES

There is currently thought to be one way to send entirely cryptographically secure messages: a method known as One Time Pads. You know it's good, because it's also known as the Perfect Cipher.

The way it works is you first securely share a key with the person you want to receive your message. The key has to be at least as long as the message itself. For example, if my message was 'MATHNEWS IS PRETTY OKAY', I could use the key 'ABCDEFGHIJKLM-NOPQRSTUUVW', which would be a terrible key because it's not random but, whatever, work with me here.

Then, you assign each letter a number, add them together, and the result is your ciphertext. For example, if  $A = 1$  and  $M = 13$  then  $A + M = 1 + 13 = 14 = N$ . The ciphertext in this example would be 'NCWLSKC IS-CLBETIJPTGEW'. The person on the other end can then decrypt it by subtracting the value of the key from the message to get what you originally sent.

Blah blah blah, it's totally secure, that's not the point. Let's say you want to even hide the fact that you're passing secret messages. After all, a secret is more easily kept if no one knows to look for it, right? So you come up with something you would conceivably say, and you want it to be used as the ciphertext.

Well, it turns out this is totally doable! The decryption scheme is ciphertext - key = plaintext. Rearranging this, the key is the ciphertext minus the plain text. So, if you go to a website that automatically encrypts and decrypts messages, put the ciphertext you want in the ciphertext field, the plaintext in the field for the key, and select decrypt. Since decryption subtracts the key from the

ciphertext, this operation will give you a key that, when applied to your ciphertext, will display your plaintext.

What does this mean? Well, let's say I'm having a conversation with good old Alice and Bob. Maybe I want to share a secret with Alice, but not tell Bob. In our group chat, I might post "Hey Bob how are you liking first year?" but then in a private message, I would send Alice "ZESVXCBOZDR ZCC PWUPGDV NDOAOGF" which she can then use to decrypt the publically sent message to "I FEEL LIKE BOB IS KEEPING SECRETS".

Is this useful? Not really. It requires you to have a secure channel after you have generated your message, in which case, why not just send the message through there instead? But that's not the question you should be asking. The question you should be asking is, is it AWESOME?

To which I say: HELL YES.

Also, with regards to the title: KENJRTK SB A FRWA TXNSZBMZ

*Diminutive Rex*

## FACTORIO

Do you like to theorize, actualize, and optimize? Do you enjoy being in charge of ever-growing facilities? Do you hate my sales pitch? If you answered yes to any of these questions, check out Factorio on Steam and online!

*nerd*

**SUBMIT ARTICLES, GRIDSOLUTIONS, AND PROFQUOTES TO MATHNEWS@GMAIL.COM OR THE BLACK BOX ON THE THIRD FLOOR OF THE MC.**

## HOW TO BEAT A DEAD HORSE

OBVIOUSLY A METAPHORICAL DEAD HORSE, AS TRYING TO BEAT A REAL DEAD HORSE IS TOO MUCH EFFORT

First, find a dead horse. Make sure that its owners either don't notice or don't care about it being beaten. Horses are expensive creatures to own. Given that they own their horse, it's safe to assume that they care about it. However, we aren't talking about real horses.

The trick to beating a metaphorical horse is to pick the right topic. A naive person would select a topic that they are tired of hearing about. A better choice is a topic which you are tired of hearing people complain about still hearing.

Once you have found such a topic, no actual originality is required. Just Google the topic, read a few articles about it, and repeat the identical lines found in the articles. People will appreciate the complete lack of subtlety as you bash your opinion into their heads for the nth time. They can't remember the exact number due to the figurative concussion you are incurring.

An example of a good topic would be Elbow Gate. That happened last week. By the time this issue comes out, not only will the horse be dead but buried as well. Picking such an obvious subject is a clear sign that the writer is lacking inspiration.

*Beyond Meta*



## PROFQUOTES

### SPECIAL THANKS TO THE ONLY PERSON WHO EVER SENDS THESE IN

"I used a Microsoft example this morning. That was awful. I shouldn't have done that."

Avery, CS 349

"Do you think they implemented those missing widgets? No! That would be work."

Avery, CS 349

"JavaFX is up-and-coming. It's been up-and-coming for six years."

Avery, CS 349

"Fear my meek coding skills."

Avery, CS 349

"Hey look, this is real world stuff we're showing!"

Avery, CS 349

"Art is really easy. All you have to do is slap some paint around."

Avery, CS 349

"I hate that animation, but I don't have the heart to take it out. Someone worked really hard on it."

Avery, CS 349

"Any errors you see on the slides are on purpose."

Weddell, CS 348

"This is just a simple painting program. It's so simple that the menus and buttons don't work."

Avery, CS 349

[*Student answers correctly for the third time.*] "Why are you even in my class if you already know everything?"

Badawy, CS 456

"I will try to remember to correct those errors before three years go by."

Weddell, CS 348

"I want to stress that I had nothing to do with the SQL standard. I'm completely innocent."

Weddell, CS 348

## N REASONS LÚCIO IS THE BEST

- He boops people off cliffs to their deaths!
- His futuristic music gun takes old-style pneumatic cartridges
- He goes very very fast
- He can go extra fast sometimes
- He asks D.Va for her autograph in the spawn area
- If he falls off a cliff, he can skate up the side of the cliff back to safety
- There are posters advertising his tour on some of the maps
- He's a freedom fighter!
- He makes fun of Reinhardt for liking Hasselhoff
- He staged an uprising to get rid of corporate overlords once
- Sometimes he can skate up poles

- One of his skins makes him look like a bizarre frog
- He's literally the most positive and upbeat dude in the entire universe
- He makes everyone feel better
- He can make people feel extra better sometimes
- His hair looks like noodles

*Diminutive Rex*

## N REASONS WIDOWMAKER IS THE BEST

- She hides in the shadows
- She can take out all her enemies without ever needing to get close to them
- No one can hide from her sight
- She's basically a badass assassin; she's such an awesome assassin that she can fight Tracer while successfully assassinating a robot.
- She has a grappling hook, so she can fly all around and get up on high ledges
- She's smart enough to use poison mines to set traps
- She has a scope for even better accuracy
- She helps out her teammates by sharing her infra sight with everybody on her team, not just herself
- One of her voice lines is, "Let them eat cake"
- She has blue skin!

Not obsessed with Overwatch at all,

*Shay Blair*

## N REASONS TRACER IS THE BEST

- She's British
- She's very British

*Dusk Eagle*

## RUSSIAN REVIEWS: DOMINIONS 4

DARK RITUALS, HUNGRY GODS,  
VAST ARMIES, TOTAL DOMINATION

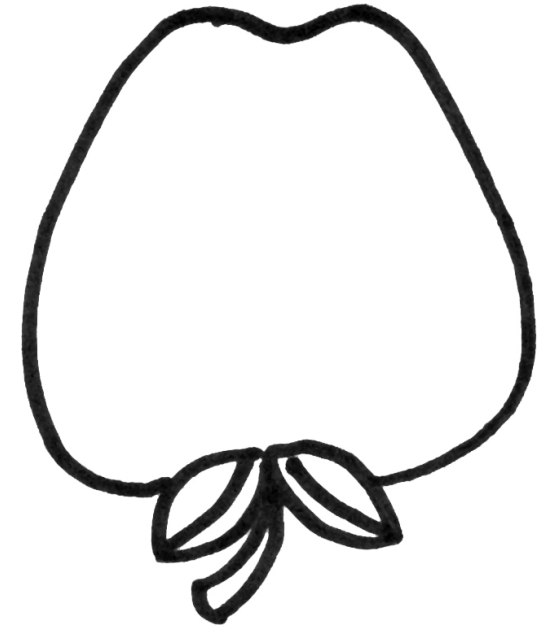
In neat columns and rows the legion stood, spears points glinting in the sun. To the flanks of the mortal legion stood ghostly figures that seemed to fade in and out of existence. Behind them all stood mage-priests in dark robes casting spells. Across from them stood the armies of a false god, men and monsters similarly preparing for battle. Light began to fade around the legion, an unnatural midnight glow blanketing the battlefield that signaled that preparations were complete, and the legion with their ghostly allies advanced as the ground began to rumble. The battlefield was ripped asunder, magical bolts and balls flung back and forth, men and beasts clashed, dead rose and fought, and the gods all watched. As the dust settled, the legion lay defeated, but it mattered not, for more were being sent, the gods all thirsted for the power that the thrones of ascension held, and only one could have them all.

Dominions 4 is not a regular turn-based strategy game. Yes, it has research, battles, and recruitable units, but it is much more complex than just that. First, all units are 'available' from the start, you can recruit anyone you want so long as you have the resources, except for summoned units (which will make up a chunk of your forces), which require research, and all heroes/leaders which need items. Research is purely magical and magic is complex. A given spell is unlocked when you reach a level (out of ten levels) in one of the eight schools of magic (e.g. construction, evocation), and the spell can

only be used if your mage has the required magic paths (e.g. fire) of which there are nine, and most mages only have 3–4 points in (e.g. 3 in one path, one in another). When you consider that most nations only have a handful of mages available, and that they all are similarly pathed (e.g. towards fire), most of the hundred-ish spells in the game are actually inaccessible, but what is left over is still very powerful (for 3 fire and 1 astral, you can blot out the sun, leaving your enemy blind while your dark-visioned units are unhindered). Just trying to learn all the spells in the game and the synergies you could accomplish with them (using other spells and units) could take up a weekend.

Turns are done simultaneously, with orders made and then submitted to the server (even in singleplayer, your computer is a 'server') which determines the results of all orders from all players. Battles are necessarily done automatically by the server, with your units following orders and formations you set for them ahead of time, and you can (and should) watch the outcome, adjusting your forces for the next fight. The map is made up of various provinces (including underwater provinces), and things like rivers, mountain passes, and tunnels can restrict movement between provinces to certain types of units, or to certain times of the year (with 8 turns in a year). There are so much more that can be said about the game, but I have written enough, and will just end by saying that the game is complex but not complicated, something that you can quickly and easily start playing but will spend a long time mastering. I definitely suggest you take a look at it.

*Soviet Canadian*



## ARTICLES OF THE ISSUES

The award for Article of the Issue for v131i1 goes to Zethar for saving our arsens with emergency puzzles! Thank you, Zethar. You can pick up your reward eventually.

The Article of the Issue for *this* issue goes to Diminutive Rex's "Top Ten Amendments to the US Constitution". Congratulations! You can also pick up your reward... eventually.

*The Editors*

**1 + 12 = 11 + 2 AND "TWELVE PLUS ONE" IS AN ANAGRAM FOR "ELEVEN PLUS TWO"**

## GRIDCOMMENT

Hello. It's me again, filling out for the *gridWORD*. Nobody submitted anything by the time that this issue went to print for the previous puzzle. It's alright, though; newest intel has indicated that the crazy conspiracy theorists were plagued by logistics problems and everyone has gotten themselves two extra weeks to try and solve it! The puzzle itself can be found under v131i1 at [mathnews.uwaterloo.ca](http://mathnews.uwaterloo.ca). Deadline is the same as this week's issue, and tie-breaking question for last issue's puzzle can be found in the previous issue.

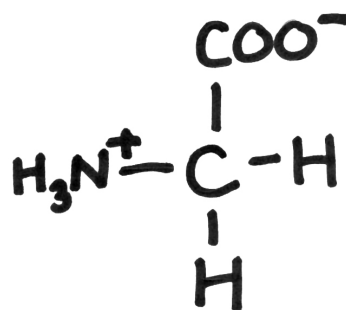
This issue consists of something more in-line with what a *gridWORD* usually is; for starters, it has an actual grid. And words, too, I suppose, but that was true of the previous puzzle as well. This puzzle is a bit different from a usual crossword. There are clues, sure, but here's a list of differences:

- Some of the letters on the grid are already filled out. These letters do not appear anywhere else in the puzzle. Some boxes are labeled with a digit in the corner. All boxes with the same digit are filled with the same letter, and this letter will not appear anywhere else in the puzzle.
- There are some boxes with a symbol in them. These boxes have a unique letter that shows up only in that box and nowhere else in the puzzle.
- Finally, each of the clues matches up to at least one of the entries in the grid, like a normal crossword, but are presented in an unordered manner.

As usual, submissions are accepted via email to [mathnews@gmail.com](mailto:mathnews@gmail.com) or physically to the ravenous

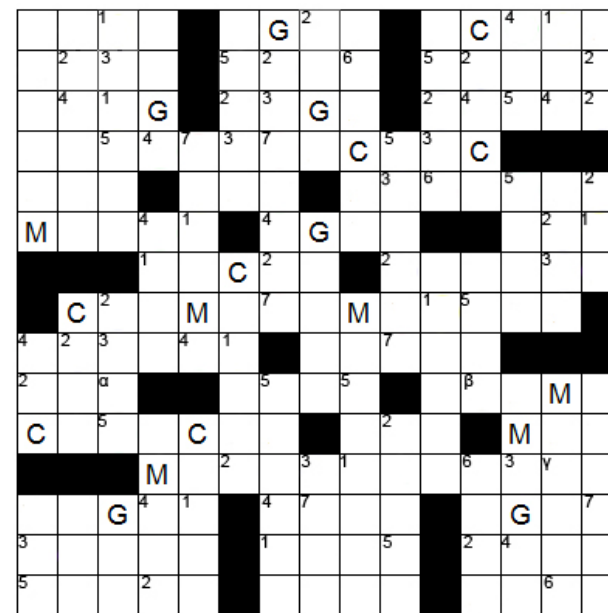
**BLACK BOX** outside of the Math Comfy Lounge. The deadline is 6:30 PM on Monday, June 6<sup>th</sup> and the most correct submission will fight for a shiny prize determined by the *mathNEWS* editors (usually a gift card of some sort). In the event of a tie for most correct submission, ties will be broken by my favourite answer to this issue's *gridQUESTION*, "What do you dread the most?"

*gridMASTER* pro tempore out,  
Zethar



## GRIDCLUES

- Cool grasshopper and stinger component
- A sailor's weapon against tangled wire
- Describes Batman, Will Hunting, and Mike Ross
- May be a  $\Delta H$ ,  $\Delta W$ , or  $\Delta U$  in proof
- Short hour
- American govt. property overseer
- Whales, dolphins, or porpoises
- Where you would find one of India's iconic sights
- Mother-of-pearl
- Bow; peace
- Spanish friend
- One's children



ABCDEFGHIJKLMN OPQRSTUVWXYZ

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