# Russia Inclined to Support Our New Regime
## *Free Vacations Offered in Crimea and Syria*

## *look*AHEAD

## Article of the Issue

The Article(s) of the Issue are the Tessel-Eats drawings. Because sometimes pictures need some loving too.

So the artist of the drawings can come by the office to claim their prize. Continue contributing art to us and we can continue having pretty pictures in our issues!

See my masterful use of not including the words math or news since I'm too lazy to format? Genius.

The Editors

Thomas Baxter (Blue Yarn Yoshi), Katherine Tu (Pink Yarn Yoshi), Jose-Miguel Velasco (Green Yarn Yoshi)

## *mast*HEAD

Liberals won with majority government. Not exactly what I would have wanted, would have preferred a minority. That way we can have another election since elections and elections issues are jolly good fun! Hence our question for this week.

We asked our writers this issue: "What party would you create to run in this election?"

2.3.5.7.735.2333772 ("snew Democratic Party"); Paru-paro ("Never Split the Party"); waldo@<3.LE-GASP.ca ("The Pink Rhino Party"); Soviet Canadian ("The party dorned with the most extravagant and superfluous titles"); TheUndecided ("I am the party."); Githro ("The Pity Party"); stubbs ("The Stubbs Family Reunion Party"); Zethar ("The draconic conspiracy works in concert, forming an orchestra of political intrigue and visages, obscuring the true nature and directives of the country."); himynameis ("luberals"); bluecat ("proservative party"); prez ("The Harrap Regime"); Depressimist ("What does it matter? They'd still lose and end up brought out for the price of our rights."); me("Make America Great Again® party. (canada is a part of america like it or not)"); teapot ("The T Party"); Dusk Eagle ("The Pirate Party"); TotallyLegitDeveloper ("The Old Democratic Party. Just to mess with people."); Shay Blair ("The Party that advocates for pools"); Pizza Freeloader Kid ("A party that cared about Canada, led by Bernie Sanders. Bernie 2016!"); DiminutiveRex ("The Pyjama Party") AFK@mathNEWS ("The Highlander Party - there can only be one!!!"); Scythe Marshall ("The Take-the-Best-Ideas-From-All-the-Other-Parties Party."); ConvolutED ("The I-Think-I'm-A-Rhinoceros Party, stampeding around Canada and goring our opponents");

SketchED ("My regime. Ruling with an iron fist. So what I'm currently doing right now.").

## Games Sez

First of all, a huge thank you to all of you who attended our Games Night with Profs event last week, especially the profs. If you enjoyed it, or just like board games in general, feel free to come to our regular Games Nights on Thursdays in the C&D. We start at 6:30 PM, but feel free to drop in at any time during the night.

Second, it looks like the games e-mail isn't set up! So, if you want to post (mostly) anonymously to the Facebook group (or don't have a Facebook account), just e-mail me directly at h6fung@uwaterloo.ca with your name (or pseudonym).

Lastly, we're holding newbie games! Has there ever been a game in the office you've wanted to play but were deterred by complicated rules? If so, feel free to make a request in the Facebook group (https://www.facebook.com/groups/MathSocGamesNight/) or to me (see e-mail above). You can sign up with friends or by yourself, and we'll try to find enough new(ish) players to round out the table.

Your Games Director,
a crafty player

# Prez Sez

Hello Mathies!

Hope you are all having a good term, and are doing well on your midterms. Remember that there are lots of events happening if you need a break, including the popular Games Night every Thursday evening at 6:30 PM.

If you need help with your assignments or studying, there are lots of upper year students willing and happy to help in the club offices, as well as the MathSoc office. We also have an exam bank online, which is open to all MathSoc members (Math students are members by default).

Remember that there is a Tutorial Centre as well, and that your profs are friendly and will be thrilled to see you at office hours (in advance of the midterm day).

If you still want to be involved, email the executives at `exec@mathsoc.uwaterloo.ca` and we can try to find a position for you!

Tristan Potter
President, Mathematics Society

PS: Take a look at the other articles in this issue for Space, Senate, and Director First Year Affairs Sez :)

# CS Volunteers Sez

School of Computer Science is now recruiting volunteers! Interested in representing Computer Science and would like to know more? Here are a few events you can take part in:

### Fall Open House

On Saturday, November 7th, Waterloo is opening its doors to students and their families that are interested in applying to UW. Want to be part of the event and help us run it? There are 4 volunteer roles you can choose from. So hurry up and sign up before October 30th!

### CS4U Day

An annual Computer Science event is taking place on Monday, December 7th this year. This event introduces high school students and their families to Computer Science and will be running for the whole day.

### Weekly Tours

If you are an experienced upper year student who wish to become a CS Ambassador and is interested in providing weekly tours on behalf of CS and Math Faculty, wait no longer! This opportunity might as well be the best fit for you.

Email `cs-ur-co@uwaterloo.ca` (Barbara) to apply, or if is you have any questions.

# Senator Sez

Hello all,

FALL READING BREAK EXISTS FOR 2016-2018!!!!

Details:

Senate is the body that approves or rejects basically everything that is happening within the University of Waterloo and they met on Monday October 19th, 2015. I (Tristan) am the current Math Senator (in addition to the MathSoc President).

An ongoing project of Feds, MathSoc (`http://mathsoc.uwaterloo.ca/council/minutes/369`), and the student senators had been working with the University administration to get a Fall Reading Week for a couple years now, and the culmination of these efforts was a motion that created half an hour of discussion in Senate.

The motion states that there will be a trial of a reading break of two (2) days that will occur the Tuesday and Wednesday after Thanksgiving for the next three years, and classes will now start the Thursday after Labour Day. It passed by a landslide, and data will be collected over the next three years to determine if this is something that should become a permanent part of the University calendar.

If you have any questions feel free to contact the Feds President (`pres@feds.ca`), Feds Vice President Education (`vped@feds.ca`), or myself (`tristan.potter@uwaterloo.ca`).

Tristan Potter
Math Senator, University of Waterloo

# Calling All First-Year Students Interested in Actuarial Science!

On Wednesday, November 11th the Statistics and Actuarial Science department will be holding an information session about what students need to know about majoring in ACTSC. This will include:

- courses you should be taking in 1st year
- marks you'll need in those courses
- other skills that will help you in ACTSC
- 2016 program changes
- the program in general

If this sounds like something you'd like to come to, then RSVP (see below) and show up on **MC 2065** on Wednesday **November 11th** from **5:30–6:20 PM**.

There will be refreshments, but to make sure we have enough you need to tell us you are coming. Please post a message on the Actuarial Science Advisor Facebook page (`http://www.facebook.com/WaterlooActuarialScienceAdvisor`) or email us at `actscadv@uwaterloo.ca` to let us know you're coming.

## DFYA Sez

Hey, first years! As you (hopefully) know by now, we have five new First Year Reps for MathSoc. The elected First Year Reps are: Imran Ahmed, Stephen Brock, Austin Cho-Wong, Angel Yang, and Mary Wang. The MathSoc Software Engineer class of 2020 representative is still to be determined. Each first year rep has a seat on MathSoc Council, which means if you have concerns or questions, you can go to them, and they'll bring up your concerns to council. If you have any ideas for first year events, feel free to contact them or myself. Additionally, we have planned this term a few games nights just for first years, as well as a "First Year n Chill", where we sit around the Comfy drinking hot chocolate and having some time to relax and destress before finals.

Deanna Darby Barton, Director of First Year Affairs

## SPAAAAAAAAAAAAAAAAAAAA— AAAAAACE SEZ

Hey everyone! So, the Space Committee was formed last week by MathSoc Council, and the purpose of this committee is to perform all necessary motions required for determining current usage of space, possible improvements, and what we need moving forward. The undergraduate members of this committee are: President Tristan Potter, VP Operations Simon Huang, VP Internal Kevin Xu, Math/Bus Rep Tyler Wang, Math Studies/Other Rep Deanna Darby Barton, First Year Rep Angel Yang and First Year Rep Mary Wang. If you have any questions or concerns about space in the math buildings, whether it is study space or social space (this includes clubs, MC Comfy, Math C&D, the balcony, and the third floor hallway) feel free to contact any of us with your concerns.

MathSoc Space Committee

## N Reasons I Want My Own 24/7 Backup Dancers

- Backup dancers usually come with backup music, and I think my life would be a lot better with a constant soundtrack.
- If I ever got too tired to walk, they could just pick me up and carry me around on a bench or something, all while doing really cool dance moves.
- They'd make me look way more sophisticated and intimidating.
- If I have backup dancers, it probably means I'm hella rich and can afford to waste my money on that kind of thing.
- They'd be like a security team since I'd never have to go anywhere alone.
- Anytime I walked into a club, my crew would be the coolest people there with their mad dance skillz.
- Honestly, backup dancers just seem like fun people to have around all the time.

TheUndecided

## A Response to Relationship Graphs

Like DiminutiveRex, I am also taking a graph theory course (CO 642). Having discussed minors for the entire first month of this course, I instantly spotted an error in the article Relationship Graphs, which appeared in the previous issue. So, as a public service announcement, and as an attempt to save people like former housemate Scythe Marshall from even more grief while marking assignments (but more importantly because the only thing worse than marking is fixing mistakes your marker makes; everyone's unhappy then), I feel it is my duty to provide the following correction.

Kuratowski's Theorem tells us that $K_5$ and $K_{3,3}$ are the only nonplanar minors, not just subgraphs. Consider, for example, everyone's favourite graph and counterexample, the Petersen graph. For those who don't have a graph theory textbook nearby with the Petersen graph on the cover like I do, the Petersen graph is constructed by taking all 2-element subsets of a 5-element set as vertices, and adding an edge between two vertices if the subsets they represent have no common elements. Hence, the Petersen graph has 10 vertices and is 3-regular. Therefore, the Petersen graph clearly cannot have $K_5$ as a subgraph. It also does not have $K_{3,3}$ as a subgraph, because three nonadjacent vertices use at least three elements in the subsets they represent, so a 6-element set would be required. However, the Petersen graph is not planar; the proof is left as an exercise.

So how do we find minors of graphs? Like subgraphs, we're allowed to take out vertices and edges, but we're also allowed to contract edges: take the two end vertices of an edge and replace them with a new vertex adjacent to all the neighbours of the two old vertices. (The Petersen graph is especially interesting in this context as it contains both $K_5$ and $K_{3,3}$ as minors.) The key idea for us is that we can subdivide the edges (replace the edge with a vertex adjacent to the two endpoints) of $K_5$ or $K_{3,3}$, and still have nonplanar graphs. So, if we choose the right edges to subdivide, we can find a bipartite graph with a $K_5$ minor, and hence achieve this nonplanar minor with a hetrosexual friend group (but with at least four more friends involved).

In conclusion, I agree that knowing your graph theory is the best way to figure out how to obtain nonplanar relationship graphs, and that having a lot of gay or bisexual friends is still an asset, as we won't need a bipartite graph.

$$V - E + F = 2$$

## What the...

Incredible. This article made it into *math***NEWS**.

AltGr

## Hey clubs! Want your Sez in *math*NEWS? Then be sure to submit them to us!

## Investors Wanted

For a while now, I've dreamed of owning a castle in Scotland[1]. Not going to lie, that would be pretty cool. The problem is, those sorts of things are a little out of my price range. I'm a few pounds short of the ~3 million price tag. Then I had a brilliant idea: Crowdfunding!

Why should I have to pay the full price[2] when I can get other people to fund it for me? Clearly, reasonable people would see the innumerable benefits of giving me money to buy a castle in Scotland. For one, they always say it's better to give than to receive. And when they imagine the joy they'll be responsible for, as I bask in the glory of my magnificent castle, they'll be hard pressed to say no. And there's got to be tax benefits for a donation like this[3]

Of course, for the stingier potential investors, I can also offer backer rewards. At an entry level donation, I'll tag a brick with the backer's name when I post photos on Facebook showing off my castle. Throw in a more sizeable donation, and I'll actually get one of the bricks engraved with your name[4]. Donate the big bucks, and I'll let you visit my castle[5].

If you're interested in backing this project, please slip an envelope full of money into locker #240 on the third floor of MC6.

Thanks for the cash[7],

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

[1]Somewhere in Scandinavia or Iceland would be cool too
[2]Or, you know, any of the price
[3]Note: I am not a tax lawyer or accountant
[4]More like haphazardly chiseled in, but whatever
[5]I'm not paying for airfare or anything though
[6]Cash only, for tax reasons[3]
[7]Suckers

## T-62 Series Vacation Home

*Reserve Today!*



## Hey klubs! Want your Kommandant Sez in математическая*NEWS*? Then submit today! Or we come vacation tomorrow.

## Trick or Treat: Student Version

"Trick or Treat. Smell my feet. Give me something good to eat. Not too big, not too small, just the size of Montreal."

This is a rhyme I learned as a child. Though it was a bit rude for me to have ever said out loud, the basic idea seemed pretty good to me. Tasty, excessively large candy? Yes please. However, life has gotten more complicated since then. I feel that the following version of the rhyme is a bit more applicable to the modern university student.

Trick or Treat.
I feel beat.
Give me something decent to eat.
I don't care. Anything at all.
Or just give me alcohol.
I'm broke as fuck.
Student life sucks.
I guess I'm just out of luck.
I forgot to do laundry. Nothing is clean.
So I'm dressing as a bum for Halloween.
Midterms are crushing.
I'm always rushing.
I don't even have time to make the rest of this rhyme because I have too much shit to do.

Happy Halloween!

TheUndecided

## Liberal Landslide

After the election results came in on the night of Monday October 19th, it became apparent that it was a huge win for the Liberal Party of Canada. This result was a disappointment to both the Conservatives and NDP who were both hoping to take enough seats to form a government. "We said we were going to win!" Trudeau said during his acceptance speech, "And we won big!... Now what? Seriously, we weren't really expecting this and really don't have any good plans for governing."

Despite the new Prime Minister's blunder on national television, the brutal honesty has improved how he is perceived by the Canadian public according to the latest polls. Top-ranking Liberals have been reported as saying, "Now we're in power, we're trying to come up with a plan but we really don't know where to start." Conservatives have taken to the streets demanding that Harper be allowed to stay on; however, now that they are no longer in power, police have moved in and began firing tear gas canisters into the crowd of "rioters".

With Ottawa floundering, many Premiers have taken it upon themselves to claim greater autonomy. The most prominent examples are that of British Columbia's legalization of marijuana, New Brunswick's invasion of Maine, and the Yukon's annexation of Alaska. Trudeau has shown an aptitude for the position though as he persuaded the U.S. Federal government to not involve itself after arguing that these are just "state issues".

Stubbs

# *horror*SCOPES

**ActSci:** You play Traders of Osaka for the first time during MathSoc Games Night. You are appalled at the misrepresentation of insurance in the game and you decide to design your own board game with accurate representation of purchasing and selling life insurance policies.
*Your unlucky number is:* 0, the number of wordly souls interested in playing The Game of Life Insurance.

**AHS:** You play Twister during MathSoc Games Night. To make things more challenging, you extended the game surface to walls as well.
*Your unlucky number is:* 11 players smushed up against the wall between your muscles.

**AMATH:** During MathSoc Games Night, your friend invites you to play a card game where you must prove statements with phrases cut up from theorems. Although you can't precisely recall the order of the quantifiers, you manage to construct some hysterical proofs and have a blast.
*Your unlucky number is:* 10 points for: For all $\delta > 0$, there exists an $\varepsilon > 0$ such that if $|x - a| < \delta$, then $|f(x) - a| < \varepsilon$.

**ARTS:** You play Modern Art during MathSoc Games Night, and you are dismayed to discover the hideousness of the cards. You decide to design your own cards and send a copy to the creators of the game.
*Your unlucky number is:* 1 letter of appreciation from the creators of the game, for providing them the most awful set of artworks for their next edition.

**C&O:** After noticing an absence of the game Cards Against Humanity at MathSoc Games Night, you decide to design your own variant of the game, "Theorems Against Humanity". You chop up statements of various theorems rope some friends into trying to construct semantically meaningful statements.
*Your unlucky number is:* $\varepsilon < 0$ is a hilarious alternative.

**CS:** Your friends invite you to a social event involving proofs and board games. Although proofs are not your strong suit, you realise you can quickly brute force solutions by running simulations of games. You spend the weekend running simulations of Arkham Horror.
*Your unlucky number is:* 0 proofs at Games Night With Profs.

**Double Degree:** You are roped into playing the Chairman's Game for the first time during MathSoc Games Night. Bewilderingly, you receive a stack of penalty cards every time you ask someone to explain the rules.
*Your unlucky number is:* 2 hours after the game, you still keep your yap shut for fear of death by a thousand cards.

**ENG:** You play Power Grid during MathSoc Games Night. You use your management and scheduling skills and quickly monopolise nuclear power.
*Your unlucky number is:* 2 environmentalists ganged up on you and embargoed nuclear fuel immediately before the last turn. You were unable to power all your plants and lost. Wind energy won.

**ENV:** Your friends invite you to a social event involving board games and the conservation of amphibians in their habitat.
*Your unlucky number is:* 0 frogs, 17 profs at Games Night With Profs.

**Math Bus:** You overhear of a great idea for a mathematical card game and the creator has agreed to allow you to commercialise the game. Finally you get to use both aspects of your degree!
*Your unlucky number is:* 12, the total number of potential customers in the world.

**Math Phys:** After playing Polarity at Board Games Night, you decide to design your own geometrical board game involving magnets.
*Your unlucky number is:* 34 point sized magnets in a frictionless vacuum, with no way to move them unless you perturb the system.

**PMATH:** Your friend convinced you to play a card game they invented at MathSoc Games Night. During the game, you become increasingly frustrated as points are awarded to the hasty untrue statements made by the other players.
*Your unlucky number is:* 0 points for assembling vacuously true statements.

**SCI:** You decide to play Set during MathSoc Games Night. During the game, you realise the cards can be used to represent genetic combinations. Encouraged, you construct your own visual representations of the population genetics of your research project.
*Your unlucky number is:* 12 of the 117649 possible genetic combinations exist in nature.

**Soft Eng:** While playing Hanabi during MathSoc Games Night, you become increasingly frustrated with the number of avoidable mistakes made by the other players due to human error. You decide to write a program that plays Hanabi optimally so you can play with the competent program instead.
*Your unlucky number is:* 27 avoidable mistakes made by you, your program is laughing at you.

**STATS:** During MathSoc Games Night, you decide to bring your Mahjong set and play with your friends. Halfway through the game you decide it would be a really good idea to calculate the expectation of each of the special hands.
*Your unlucky number is:* 54 minutes later, you look up and realise your friends have abandoned you.

Submit your articles, *prof*QUOTES, political rants, and majority governments to mathNEWS@gmail.com or the BLACK BOX near the MC Comfy Lounge.

# Conservative Coup in Canada

Prime Minister Stephen Harper is claiming a sweeping mandate after the conservatives win a landslide victory after the Canadian election on Monday. Trudeau and Mulcair both conceded early Tuesday afternoon after both the Liberals and NDP demanded recounts in all ridings; the recounts did not change the result.

There have been widespread allegations of voter suppression in left-leaning areas. Some news outlets are publishing supposed evidence of election fraud. The conservative government has acted swiftly and boldly to investigate these claims with arrest warrants already being issued to high-ranking Liberal and NDP party members that the government alleges are implicated. To ensure that further misinformation is not spread and so keep the Canadian public's faith in the system, Harper saw fit to call an emergency session in parliament where they passed constitution amendments that limit freedom of expression.

It is expected that the Harper government will enact many measures over the next four years including new laws to help prevent voter fraud by limiting voting and an implementation of a draft to help reinvigorate Canada's military ahead of planned Canadian expansion.

A more popular move by the conservatives is to sponsor Canadian military members' vacations to Florida. This is despite the numerous uprisings in the state where the freedom fighters are demanding independence from the U.S. and then the right to join Canada if they want. Harper maintains that the two events are distinct.

In his charismatic acceptance speech, the now Supreme Leader Harper proclaimed, to the cheers of fanatical Canadians, that the future of the true north is safe in his authoritative hands... and also that global warming still isn't a thing.

Stubbs

# Politic So Hard

Thank god my political party did how they did in the election. They really tried very hard to politic and were much better at politicking than the other political parties. The votes they scored were impressive, and I was very surprised at the number of votes the other parties scored.

They practiced their politicking very rigorously until they were much better at politicking and could do everything that they did.

Yours in political knowledge,
Shay Blair

# The Great Logo Conspiracy

One horrible day last term, we noticed a tragedy: how wrong the MathSoc logo was. The alignment along both the vertical and horizontal lines is off, the kerning is wrong, the outline around the letters is uneven and only some of them are filled in with black, letter size is inconsistent, some letters look cut off, and the "o" is square. We all blame waldo @<3.LE-GASP.ca for pointing this out. Upon noticing this catastrophe, we took it upon ourselves to find all of the flaws and outline them on a math**NEWS** cover (Volume 128, issue 6). We then launched an inquiry into this scandal.

We discovered that the original font that was used to design the logo was perfect. None of the design flaws found in the logo were present in the original font. This means that the designer of the logo had to put extra effort in to make it terrible. We promptly embarked upon an epic quest to find out who was responsible for this heinous crime.

We first utilized the Internet archive site WayBack Machine, to go back through the history of the MathSoc website to find the first usage of the new logo. We discovered the change happened in the early 2000s, around 2003. The logo has been in use since 2003, and no one has objected. Using the same tactic, we unearthed the names of those responsible for this disaster.

Mike Jepson, MathSoc President, and Raymond Lai, MathSoc VPAS.

We proceeded to search for more information on these criminals. We tried to find them in the graduation composites, but the relevant years were suspiciously, conveniently missing. We searched through math**NEWS** for mentions of the logo change and for any information on the pair, but found very little.

Eventually, we searched valiantly through yearbooks to try and put a face on this dastardly deed. Though it took hours, we did eventually succeed and also confirmed the time they attended UW.

One thing we did discover while searching through mathNews was the conspiracy behind the exec. Despite the fact that Mike Jepson was actually the president, Raymond Lai wrote almost all of the "Prez Sez" in math**NEWS**. This led us to two potential theories.

One possibility is that Mike Jepson was actually useless, and Raymond Lai was secretly (or blatantly) the power behind the throne, and he was the driving force.

The other possibility is that Raymond Lai had to write all the "Prez Sez" because Mike Jepson was too busy ruining the logo.

Yours in revealing #thetruth,
Shay Blair.

# Follow us on Facebook (*math*NEWS), or in person (MC 3030)!

# A Happy Accident

Good day fellow math nerds. It is your favorite Pastry Genie here to help you with all your baking needs.

You don't have any baking needs, you say? Well then I guess you should just move along to the next article. Keep in mind if you do that then you will never learn about the joys of accidental toffee. Which some might argue is the best sort of toffee. But please, don't let me keep you. Go on. Turn the page and ignore anything you might have read about accidental toffee. Are they gone? Good. Now let's get down to business.

Baking is an art. It is also a science. Like any science it has rules that need to be followed. But like any artist knows, rules are made to be broken. So how can it be both? If you know the rules, and I mean truly know the rules, then you can bend them without breaking them. Allowing you to create something that nobody would expect.

It takes year of study and practice to master the rules of baking. I'm not telling you this to depress you. I'm just warning you that reading about something doesn't make you an expert. Despite what all those "For Dummies" books want you to think.

I don't want you to think you can't go out and experiment and have fun with food. Because you can. In fact I encourage it. If people didn't experiment then most of the foods we know of today wouldn't exist.

Take cupcakes for instance. The reason we have cupcakes is because when making a cake you would take a small portion of the batter and put it into a clay mug/cup, or ramekin. Then you would use that small amount of batter to test the oven temperature. After a number of minutes, if the batter was still raw you would know to add another stick to the fire. If it was burnt then you would dampen the flames. The mini cake or cupcake would then be a little treat for the baker. Then someone got the bright idea to bake all the batter into mini cakes. And the cupcake was born.

The chocolate chip cookie was created by Toll House Inn's very own Ruth Wakefield. She was making chocolate cookies and ran out of baking chocolate. So she cut up a bar of semisweet chocolate and mixed that into the batter. She was hoping it would melt and make the cookies chocolate. Instead the chocolate held its shape in the oven. Now Nestle Toll House chocolate chip cookies are known all across North America.

The Popsicle was invented by an eleven year old boy in 1905. He had forgotten his soda making equipment out on the porch overnight. The next morning he discovered that the stick he had been using to stir it had frozen upright in the mixture. It wasn't until 19 years later that he got the idea patented. So thanks to Frank Epperson and his forgetfulness we have a tasty way to cool off in the summer.

Those are just a few examples of some happy accidents. I've had a few myself over the years. From the 'Bowl of Yum' in '98 to the 'Orgasm Cookies' in '06. Experimenting with food can turn out some pretty tasty treats. In fact, did you know beer was invented by accident? True story.

So if you have learned anything today, I hope that it was that you can have fun with food. You don't always need to follow the rules exactly in order to create something wonderful. Now go out there and make yourself some accidental toffee. Cheers, your friendly neighborhood Pastry Genie.

**Accidental Toffee**

INGREDIENTS
- 1 cup butter
- 2 cups brown sugar
- 1 tsp salt
- ½ cup corn syrup
- 1 tsp baking soda

DIRECTIONS
1. Preheat oven to 200°F.
2. In a saucepan combine butter, brown sugar, salt and corn syrup.
3. Boil mixture over medium heat for 5 minutes.
4. Remove from heat and stir in baking soda. (Be careful of the steam; it is very hot.)
5. Pour onto parchment paper lined baking tray.
6. Bake in the oven for 1 hour, turning* the toffee over every 15 minutes.
7. Remove from oven and cool on baking sheet for 1 hour.
8. Cut toffee into pieces and enjoy.
9. Store any extras in an air tight container in the fridge. Or, you know, bring it to the math**NEWS** production night and share with the vultures.

*I use a rubber spatula for this. I give the toffee a stir and flip it upside down. It's okay if it doesn't turn very well. Just make sure you have stirred it.

Cheers,
Your Friendly Neighbourhood Pastry Genie

# N Things Frosh Are Now Realizing

*Trust me, I'm in first year too.*

- Screw Alice and Bob.
- They weren't kidding about the geese.
- You can go a while without laundry.
- Ditto with sleep.
- My mom is the best.
- High school was so easy.
- 5th and 6th floors of MC are like a different world.
- The sound of construction $\equiv$ the sound of my tuition.
- Epsilon and Delta are the worst letters of the Greek alphabet.
- Sticking scissors in my ears is less painful than MATH 135.
- math**NEWS** will literally publish anything.

A Yam

# How to Write Proofs When You Don't Know What You're Doing

I'd like to start with a warning that I recommend this method of proof-writing only as a last resort. If you can, ask your prof, a TA, or other people in the course to help you understand, so that you actually know what you're doing and don't even need this article. This proof method is for those times when it's 4 am on the day your assignment is due and you've been working on it for hours and you're all alone in the tutorial centre and you've officially lost hope that you'll be able to figure it out.

1.  **Elaborate on the TA's hints.** If you're lucky enough to have tutorials for the course, during which the TA gives assignment hints, and you actually go to those tutorials, use it to your advantage. If the TA suggested a first step to writing the proof, do the first step. Even if you don't know how to get from that first step to a valid conclusion, do it anyway. Just do everything the TA said. Hopefully you'll get some marks for being on the right track.
2.  **Cite some theorems.** Mention some theorems from whatever chapter you're currently covering in class. Seriously, just any theorem you think might be relevant to the question. You don't actually have to follow it with any implication. If it's relevant, it might almost look like you know what you're talking about.
3.  **Throw in some extra nonsense.** Phrases like "This means…" and "By definition, …" are great examples. Personally, I like to state the definition of whatever concept I'm supposed to be writing about, and elaborate on what it actually means, without necessarily connecting it to any real conclusion. Basically just add filler until you feel that your "proof" looks like it's an appropriate length. For the last line, write "Therefore, (whatever statement you're trying to prove)." Don't worry if your therefore statement doesn't follow any valid argument. Just write it anyway.
4.  **Draw a proof box.** The key idea here is to "fake it 'til you make it". The proof box is like a little mark of confidence, like saying "Heck yes, I just wrote a beautiful proof". If you make it look like you're confident in your answer, the marker might think there's a reason for that confidence, and they might think there's actually something legitimate in your proof.
5.  **Submit.** Make sure you put your assignment in the correct drop box; you wouldn't want all that master bullshit to go to waste.
6.  **Go home and go to bed.** It's 4:00 AM and this stupid assignment is only worth like 1% anyway.

If you're lucky, you'll get part marks for being partially correct. Or the marker will get so confused trying to sort through all the random crap you wrote to find some valid argument, that they'll just assume you knew what you meant and give you some marks for it. Or they'll see through all your bullshit but give you a few marks anyway for effort and/or because they feel bad for you. But even if you don't get any marks, at least you tried, and you'll be able to rest easily at night knowing that you didn't submit an incomplete assignment.

TheUndecided

# The Scotiabank Principle

**Theorem:** All customers of Scotiabank can obtain an arbitrarily high amount of money.

**Proof:** We outline an algorithm that allows a customer of Scotiabank to obtain an arbitrarily high number of cents.

Suppose S is a Scotiabank customer who has just checked their own net worth. S now believes their net worth is $N_0(S)$ cents. Because "You're richer than you think", their actual net worth is greater than $N_0(S)$.

S then checks their net worth again and receives an updated value of $N_1(S) > N_0(S)$ cents; the cycle repeats ad infinitum. Because a cent is the smallest amount of money, all $N_i(S)$ are integers, which means that after k times checking their net worth, S will have at least $N_0(S)+k$ cents. This sequence is obviously unbounded. Q.E.D

**Exercise:** Create a bank account with Scotiabank. Write a Python script that implements the above algorithm by dynamically updating a counter displaying your own net worth, and sit in front of it for a few days. Use your new wealth to pay for Paru-paro's tuition.

Paru-paro

# GamerGate Declares Justin Trudeau No.1 Enemy



AJ @Wavinator · Oct 10
@NBomb @James_May_Not Sadly, **Trudeau** doesn't appear to be friend of gamers, free artistic expression or #**GamerGate**

ScenesterishBrit @NotaTypicalTory · 8m
Canadians have elected an anti #**GamerGate** prime minister GG **Canada**, how long before criticism of feminist is illegal

goodkingcole @ColeKinghorn · 11m
Attention #GamerGate . We have a new target. Canada's new prime minister is now public enemy number 1.

**Ottawa, ON**—GamerGaters across the globe are fraught with distress under Prime Minister Trudeau's recent incumbency. After having publicly declared himself a feminist during an interview and likening GamerGate to "misogyny", supporters of the cause have been both outraged and fearful of his newly-found leadership.

As with every great cause, critics need to be stifled and silenced, hence GamerGate's hope is to cyberbully Trudeau off the Internet, as it did with the hundreds of women before him, before his misandrist tyranny consumes Canada. Thankfully, doxxing Trudeau will be a much simpler process, since a Canadian Prime Minister's address and workplace is already publicly known.

k!

# The Friendship Paradox

Warning: This article talks about real math. If the thought of an actually informative *math***NEWS** article causes you anxiety you may want to skip this article.

The friendship paradox is neat little property of networks which states that on average your friends have more friends that you do. Mathematically is explained by the fact that the average number of friends for a random node v in a graph is

$$\mu = \frac{\sum_{v \in V} d(v)}{|V|} = \frac{2|E|}{|V|}.$$

However the equation for the number of friends that your friends have is the following

$$\frac{\sum_{v \in V} d(v)^2}{2|E|} = \mu + \frac{\sigma^2}{\mu},$$

Since both $\mu$ and $\sigma^2$ are positive we have the desired result. The squared term in the numerator comes from the fact v is a friend of u and has d(v) friends all of whom have the friend v with d(v) friends.

Intuitively this is the idea that the more friends a person has the more likely you are to have them as a friend. Conversely you are not likely to be friends with people who have very few friends. This paradox also applies to other symmetric network relations like the number of sexual partners your sexual partners have or the number coauthors your coauthors have.

Beyond Meta

# The REAL Reason Trudeau Won: Butts

*Dedicated to Gerald (Jerry) Butts, principal advisor to Justin Trudeau.*

*He's real, look it up.*

In the wake of the Red Wave, it is important for us to remember about how much politics happens in ways we don't see. Behind every Prime Minister is a great advisor that led them through their victorious campaign. Today, we want everyone to consider the political prowess of Butts.

In Mr. Trudeau's victory speech, he made special note to thank "the smartest, toughest and hardest-working" Butts, without which he may not have won a majority government.

Such expertise is rare, and Mr. Trudeau is likely to lend his ear to Butts often during his tenure as Prime Minister. Over the next five years, we can be certain that very powerful policies will be determined, in part, by Butts.

A government full of Butts is one we can ALL get behind.

The Political Posterior Analysts

# Man Goes to Vote

**Kitchener, ON** — On Monday morning, Mr. Li was seen walking into the polling station downtown with the intent to vote in the Federal Election. The results of the Canadian Federal election will determine the parliamentary composition for the next four years, and that may occasionally impact on the country's policies in that time.

After following the yellow signs directing people to vote, Mr. Li found himself in the gymnasium commandeered by Elections Canada for the purposes of voting, with a group of senior curlers in the adjoining partition of the gymnasium voicing their displeasure at the arrangement.

Mr. Li indicates to the greeter at the polling place that he needs to register to vote, wherein he was herded to a side table. Seated at the side table a woman asked Mr. Li where he lived, to which he responded. The woman looked up the address in a book, and informed Mr. Li needs to go to a different polling location to order to register to vote.

Several hours later, Mr. Li arrives at his designated polling place. At this location, there is an old lady helping people register to vote. "Please present your ID", said the lady. Mr. Li thereby offered up his health card, wherein he was promptly informed that he needs a proof of residence as well in addition to his health card. Mr. Li is reported to have left the polling place feeling "irritated".

It was not until the third time Mr. Li went to the polling place was he able to register to vote, and thus received a ballot, wherein he placed an X in an empty space. He handed the ballot to the officer, who affirmed the number on the vote, and placed it in the ballot box.

When asked about his experience with Elections Canada, Mr. Li had no comment.

Zethar

# N Things Observed while Watching the Election Results

*Waldo keeps finding out all sorts about this country.*

- There is a riding called "Tobique-Mactaquac" located in New Brunswick. No matter how you pronounce that, it's AWESOME.
- Things get VERY interesting when the majority of the country is counted in the vote.
- Yes, the official name of a political riding is "Nickel Belt".
- Sometimes the vote doesn't go your way, and you just have to get frustrated about it.
- Sometimes the vote DOES go your way and there's cause for celebration.
- A lot of great people are lost, and the new people can have BIG shoes to fill.
- At one point, you just end up seeing red....ALL THE RED.
- No matter how many polls you run, no one can TRULY predict the outcome.

waldo @<3.LE-GASP.ca

# Election Commentary from BC

*Where I can write my article \*after\* finding out who won! Hah.*

There are three main points, here, where the third point has an extended discussion.

Number One: Hey, the polls weren't even closed here before you declared it a Liberal majority! Why don't we matter? You're not helping, guys.

Number Two: Resist the urge to spit in someone's face because they were on a different side from you. Agree to work together with them, to cooperate, to discuss the issues. Be the one to bring reasoned and intelligent debate from the stovetop of idealism to the kitchen table of reality; don't just leave it to simmer away into nothingness.

Number Three: Canada elected someone who is hopeful; who is optimistic; who is willing to work together with not just his own supporters, but with everyone; who thinks that "a Canadian is a Canadian is a Canadian", regardless of their beliefs, their headwear, or their culture; who is ready; who wants to be a Prime Minister of all Canadians.

Stay alert and practice constant vigilance, of course; as citizens of this nation (or even just residents), it is your duty to call the government out on its absurdities, and make it known that since you gave the government a mandate, you are the ones to whom they ultimately answer. You are the ones on whom this country depends. Make the most of it. This means that all viewpoints are important. Whether you're a farmer or oil sands worker in Alberta, or a francophone businesswoman in Québec, or a teacher in urban Ontario, your situations need to be weighed in and accounted for.

Not so long ago, a man by the name of Jack Layton was a prominent politician in our country. He campaigned in the spring of 2011 as leader of the NDP while silently battling cancer. He stepped down as leader after the fact, and later passed away in August of that year. He was a true statesman; he defended his ideals with conviction, but he also respected not just the political process but his opponents. Upon his death, a letter penned by Layton was released to the media, addressed to all Canadians. It ends as follows, edited to avoid a party-specific message and the signature:

"And finally, to all Canadians: Canada is a great country, one of the hopes of the world. We can be a better one – a country of greater equality, justice, and opportunity. We can build a prosperous economy and a society that shares its benefits more fairly. We can look after our seniors. We can offer better futures for our children. We can do our part to save the world's environment. We can restore our good name in the world. We can do all of these things because we finally have a party system at the national level where there are real choices; where your vote matters; where working for change can actually bring about change.

...

My friends, love is better than anger. Hope is better than fear. Optimism is better than despair. So let us be loving, hopeful and optimistic. And we'll change the world."

While Justin Trudeau leads a different party, he shares a large amount in common with Layton's dream and vision for this country. It's a genuine desire to improve the country and bring our cultures together in a vibrant community, and a fierce motivation to do right by the people of this nation.

Because in Canada, better is always possible.

Scythe Marshall

# Canada Shows its True Colour, Orange

"The People's Orange Revolution has come to Canada!" claimed the new sovereign of the Soviet Republic of Canada Thomas Mulcair. In a truly unexpected result, of what many have described as the last election for at least a generation, the former New Democratic Party triumphed over their capitalist opponents.

The New Democratic Socialist Party of Communist Canada (NDSPCC) as it is now called went straight to work. They have already nationalized natural resource industries and manufacturing as well as seizing assets from capitalist pigs in order to further our glorious revolution. The Canadian public was at first hesitant to get behind such drastic measures, but popular hockey players came out saying that they think the changes in governance will be good for the sport and so they got right on board.

There has been further speculation about our glorious nation working with other revolutionary nations, but out glorious leader Mulcair firmly put this speculation to rest saying, "They are red revolutions, and thus inferior to our own orange one. They will be swept aside as the orange wave sweeps across the world."

Remember comrades: the future is bright, the future is orange.

Stubbs

*[We here at math*NEWS* welcome our new orange leadership, and their influence on our media organization, including our new government-enforced head editor, the Glorious All-Seeing Executive Editor Andrew Coyne.—ConvolutED]*

# Measuring Your Asshole Quotient

So the other day, I was walking with one of my friends while I was returning the key for a study room to the turnkey desk. We had run into the guy who had the room after us, but he didn't know if any of his friends had put down their watcard, so I wouldn't give him the key or let him into the room. As we were walking, I was idly trying to explain my reasoning behind this to my friend, but I found that no matter what I said, it kept making me sound more and more like an asshole.

I remarked to this friend that I found myself feeling like an asshole around them a lot, and that they were just too nice. Nice person that they are, they offered to act more like an asshole in order to make me feel like a better person. We decided that they could act like a jerk until their Asshole Quotient (AQ) was commensurate with mine, and then I would inform them of that, and they could go back to being the nice person they were before.

But then, I had to wonder what exactly would happen once their AQ matched mine. I would recognize the situation, but there would be a brief period between me thinking this and being able to speak aloud and tell them. During this period, my own AQ would increase, because I would be allowing my nice friend to act like a jerk beyond the bounds of the original agreement. Thus, since my AQ would now be higher, they would have to be more of a jerk to match me, so I wouldn't be able to let them know they could stop.

If you assume my AQ would then drop, I would get stuck in an infinite loop that could only be broken by my friend doing something heinous enough to push their AQ over the higher of the two values I was stuck between, which would allow me to let them know they could stop being a jerk.

Alternately, if you assume the AQ boost I got from not stopping them is persistent, then you could theorize that every time we hit the threshold, my AQ would increase once more and the cycle would never end, forcing my friend to become an incredible jerk (which some theorize explains much of politics). However, I propose that each time I fail to inform them that they can stop being a jerk, it's not quite as bad as the last time. It's like how the first time you drink your roommate's last beer, it's rude, but if you've been doing it all term, they pretty much expect it at this point.

This means that, if you take the limit of the marginal AQ increases and then add that value to my original AQ level, that's where I will be finally able to stop my friend. It would be best if they picked a particularly heinous deed to solidly push themselves over this limit (we suggested kicking a kitten, or writing for Imprint).

On another note, a case could be made that they will have to behave even worse to measure up, because everything they do to increase their AQ will be done to make me feel better, which makes each particular deed less inherently asshole-y. This could perhaps be combatted by them doing good deeds specifically to make me look bad, which would increase their AQ but would also have exactly the opposite effect this system was designed to create.

Unfortunately, all of these edge cases aside, having written an entire article about gaming this system makes me so much of an asshole that I'm just not sure my friend can ever catch up.

DiminutiveRex

# Time Delay in Distance-Writing *math*NEWS Articles
### *What happens when you read Issue n after writing for Issue n+1*

I write for *math***NEWS** from British Columbia. You know, because I'm obsessed, or something. Even-more-free-than-usual labour? I don't know, something like that.

The thing about this is that I prefer reading physical copies of *math***NEWS** to the online edition, for the most part. So as mentioned in the subtitle, I usually don't read the articles from Issue n before I write for Issue n+1. This can result in some interesting coincidences. In Issue 1 of this term, there was an article by FrozenWinters titled "N Things You Should Do on Your Assignments to Make Your TAs Cry". In Issue 2, I wrote an article titled "Motivation for Doing Better on Your Assignments".

Upon reading the former article (after writing the latter article), I've determined that we basically said the same thing, and that both articles share the unfortunate feature that they are more likely to cause students to actually do the horrible things on their assignments than otherwise. Namely, students are liable to ignore the satire in the "N Things" article, but also liable to

ignore the honest plea in the "Motivation" article out of spite. We can't win.

Also, I swear I'm not regurgitating others' articles. I promise.

Another problem with this method of writing for *math***NEWS** involve not being able to correct mistakes in an article until two issues afterwards; thankfully, careful fact-checking is a trait shared by many who currently inhabit the MC, like my good friend V - E + F = 2. So it usually works out okay.

I also have to write on my own schedule; usually this means realizing that I've neglected to write an article at 2 am Eastern Time and hammering one out and then pseudo-begging to learn what the *mast***HEAD** is, but oh well. It's still fun. And that's what counts.

Scythe Marshall

# How to Open City Bus Doors

I can't lie: city buses around town are confusing. I mean, have you tried going out the back door? It's impossible, right! And there are so many different ways to open the door, depending on your bus, that you're unlikely to ever encounter them all. Don't worry though, I have the secret tech that will make sure you never get trapped in a bus again, looking like an idiot making gigantic waving gestures screaming "Back door please! BACK DOOR PLEASE!" ... Not that I'm speaking from experience in this particular instance.

Anyway, here are the seals you're likely to encounter and the incantations to dispel them:

1.  "Touch here" yellow strips: a pair of long, skinny, bright yellow strips plastered besides each other. Start by placing a hand at the top of one strip and proceed to drag your hand towards the bottom, applying consistent pressure throughout. You should have results before your hand reaches the center of the strip. Sweet freedom!
2.  "Push" bars: a pair of gray bars protruding from the door near where it parts. Grab a bar with the corresponding hand then push like you're trying to open a jail cell door; the door should collapse under your determination (that is to say it will open).
3.  "Wave Hand Here" sticker: a large green and white sticker near the center of the double door that features a prominent hand along with the words "wave", "hand", and "here" (in that order). To part: take your right hand, raise it to the hand on the sticker like you're a police cop stopping traffic, then twist you're arm to the left and right continually producing a "wave" motion. The key to success is in subtlety; the door won't register large motions so keep them small! Sometimes just raising your hand triggers it to open; in this case you are lucky.
4.  "Place Hand Here" sticker: looks almost identical to #3 except the word "wave" is substituted with "place". In order to conquer this I'll refer to you #3.

Or, you know, you could just go through the front door and forget the whole thing.

TotallyLegitDeveloper

# N Signs I'm in a Drawing Mood
*Waldo finds herself distracted by doodling art.*

*   I sketched out a *math*NEWS production night poster.
*   I spent an entire *math*NEWS production night doodling.
*   I've been procrastinating this article so much because of doodling that I don't really have anything else to add.

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# What's This Undertale Business?

Play it, IMO

Undertale is a computer game by Toby "Radiation" Fox, who is best known for his Earthbound fan game, Radiation's Halloween Hack, and his music in Homestuck. Despite having no formal musical training, Toby's compositions in his Halloween Hack and Homestuck—and now, Undertale—are phenomenal.

Perhaps even better than the music are the game's characters. From skeleton brothers based off fonts to a lady fish knight, to a dog whose neck can stretch beyond the mortal realm, to gals who are, like, SO hyped for the destruction of humanity, all of the characters are unique and loveable.

Undertale's battle system resembles that of a turn-based JRPG, but with a unique twist. During the player's turn, you can attack by aiming at a timed target or interact with monsters in various ways. During the enemy's turn, enemies often have unique dialogue before engaging the player in a mini bullet hell. Depending on how the enemies are engaged, fights often last only a few rounds, but are challenging all the same. It is possible to complete every encounter in the game—including the bosses—without killing anyone, simply by negotiating your way to a peaceful outcome.

The game is incredibly meticulous in unexpected ways. There are easter eggs strewn all over the game—small details that a player might never notice in a single playthrough. Characters have a myriad of different reactions and comments depending on the choices and decisions you make. Fortunately, perhaps, the game has several endings depending on the actions taken by the player throughout the game, so players may want to go through the game more than once and discover its secrets for themselves.

bunniED & lp0onfire



TESSEL-EATS

bacon n' eggs
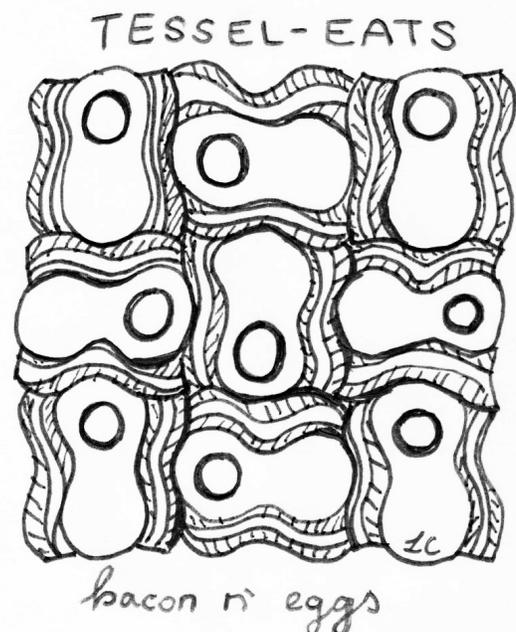
# Teemo is Fair

Several months ago, one of my friends persuaded me to try League of Legends. Being a Dota 2 player myself, I was initially hesitant to try "Dota with training wheels". Nevertheless, since I didn't have any friends to play Dota 2 with, I decided to install the game and try it.

One of the arguments my friend used to persuade me is that League had a lot more skillshots then Dota 2. So I tried to play a bunch of beginner-friendly champions with skillshots such as Ashe and Lux, but they all felt sluggish compared to Dota 2 heroes like Puck and Windranger. A lot of the champions in League just felt so underpowered and actually fair when compared to Dota 2 heroes.

There was one character, though, who was consistently the subject of loathing among all those I talked to. A demon lurking in the top lane, making life miserable for all other players in the game. The spawn of Satan himself, firing poison darts from his blowgun. The most fun and totally fair champion in the game, Teemo.

Let me tell you what makes Teemo so fun and fair, in case you are unaware.

His innate passive makes it so that if he stands still for 1.5 seconds, he becomes completely invisible until he moves or attacks. So you can just stand in lane completely invisible, wait for an enemy to walk by who's just trying to play the game, and then murder their face. A lot of fun for you and your opponent!

His first ability shoots a special dart from his blowgun, dealing approximately huge amounts of damage and making it so all of their atacks on you for the next few seconds automatically don't hit you. Nothing is more fair and fun for your opponent then getting ambushed out of nowhere by a bobblehead squirrel with a squeaky voice, and then being unable to attack back as he makes short work of your health bar. This ability isn't even a skillshot, you just have to point and click on the enemy champion. Definitely and totally fair.

Teemo's second ability sucks and isn't worth talking about. It's almost like it's actually fair.

Teemo's third ability makes it so that every opponent you attack gets poisoned and starts taking damage over time. This means that while your opponent is trying to last hit a minion to get the gold they desperately need to stay relevant in the game, you can land a single attack on them and run away, content that your poison will take away over an eighth of their total health. Rinse and repeat for the next minion they try and last hit. What a fun time they'll have playing against you!

His final ability allows him to hide invisible mushrooms all across the map. When an opponent runs over one, the mushroom explodes, dealing a huge amount of damage to everyone in the area. The fairness of this ability cannot be overstated. Let's say an enemy champion gets the jump on you and manages to kill you. Inevitably, you've probably unleashed all sorts of poisons onto them in the fight, so they're running away at low health, but thinking they survived. All of a sudden, they run over one of your hidden mushrooms. Congratulations! You just got a very fair kill from beyond the grave!

I hope you're now inspired to play the most fun and fair champion in League of Legends. Go spread the joy of playing both as and against Teemo throughout the League of Legends community!

Dusk Eagle

# Really Dumb Epiphanies

Epiphanies are great. All of a sudden, something clicks in your brain and you feel like you understand the world a little better.

But having a real epiphany is hard. You can't really predict when one is going to happen, you just need to try and tackle hard problems that you think you have the potential to solve. It is a lot easier to just pull an all-nighter, and then find your brain-foggy self having really dumb epiphanies about regular nonsense. You still get that feeling of wonder about learning something new about the world, but without any of the pressure to enact it into your life because it's probably objectively pretty stupid.

Some dumb epiphanies that I happen to have experienced in the past few hours include "Whoa, if you have a power bar then you can plug in more things", "Putting on shoes makes your feet warmer", and "Strawberry milk basically tastes like milk, but with more strawberry".

Each one of these epiphanies made me feel like I had truly worked out something new and important about the world without having to actually put in any genuine effort at all. Then, not long after reaching each conclusion, I realized that it was objectively kinda dumb, and could be discarded without having to worry about how the new knowledge I had gained might affect my worldview.

This tactic is a way to make yourself feel really smart about doing something really dumb. This is pretty powerful, because it's really hard to do really smart things, but it's really easy to do dumb things. You get the benefit of the first with the ease of the second.

Really, what could go wrong?

DiminutiveRex

# Armored Warfare (Game)
## *World of Modern Tanks*

*The gunner watched through his sights, the tank's gun extending over the top of the hill. Just a minute ago the tank raced towards it's position, but now all was quiet. In the distance vehicles rumbled, just out of sight. Suddenly a small IFV raced out from behind a building, and the gunner aimed. The Tank's gun fired with a great boom, and a massive gout of flame and smoke pouring from the gun, throwing a thin layer of loose dirt away from the blast. Other guns on either side fired, and the little vehicle was hit just as it darted behind an overturned train car. The enemy, watching from concealed positions, began to pour fire down onto the defenders revealed locations, as guns big and small aimed for exposed turrets, with missiles arcing through the air to hit the vulnerable tops of the tanks. The defending force pulled back behind cover, firing smoke grenades to cover their retreat, as a few artillery rounds started splashing down onto the area. In seconds new positions were obtained, and the fight continued.*

From Obsidian Entertainment, normally the developers of RPGs (Neverwinter Nights 2, SW:KOTR2, Fallout New Vegas, South Park: Stick of Truth), comes a new tank-based free to play game. Built in CryENGINE3 it looks and sounds great, with detailed models and effects that really helped with the feeling that you were fighting with giant armoured war machines. The maps and amount of cover and objects within is well worth the frame rate issue on some.

What will be the main attraction for most will be the selection of modern (post World War Two) vehicles, from Main Battles tanks, through Infantry Fighting Vehicles and Armoured Cars, to Self-Propelled Artillery. Arranged into multiple trees based on type (and nations where possible) and split between two dealers who deal with differently focused vehicles (ie. one is focused on the vehicles with the most firepower), with more dealers (and vehicles) coming. On top of these vehicles we get to have fun with the technology of the modern era, with things like Missiles, Smoke launchers, and Explosive Reactive Armour (where blocks of ERA are destroyed individually) available usually through research/upgrades or the vehicles.

Compared to the other big tank games (World of Tanks and Warthunder) AW plays fast, which is not to say the matches end quickly (although they do many times), but instead the speed of vehicles and lethality of weapons results in much faster-paced gameplay. You tend to get smoking husks within the first minute of contact, and forces that were fighting on the far side of the map can be attacking your rear in the matter of 30 seconds, if they have a clear path. It is this fluid battlefield that should make the gameplay interesting even to someone who has been playing other tank games for years. On top of this, there are some interesting features regarding Artillery, such as support rounds (smoke and illumination), counter-battery fire (ease of firing on enemy artillery), as well as the shear wealth of information that is presented to players in-battle. Everything the enemy knows, you will know too; whenever you are spotted, or targeted by artillery or Missiles, you receive warnings, thus you can take action immediately (which goes a long way in making players accept such long-range weapons, whereas in WoT artillery is a much hated weapon that players feel they can not defend against).

With maps that leave many avenues open for players to advance (unlike the standard 3 paths approach), and plenty of hills and structures to break line-of-sight, as well as the inclusion of a PvE/AI Co-operative mode, I can see Armored Warfare catching and keeping the attention of many tank and modern-war gamers. If you would like to grab the game (which is currently in public Beta) or find out more, visit `aw.my.com` and I hope to see you in the field.

Soviet Canadian



TESSEL-EATS
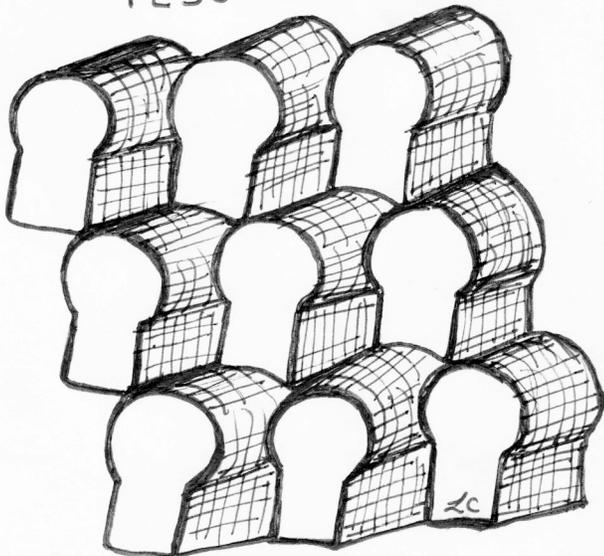
## Last Issue's *grid*WORD

| A | D | J |   | R | U | S | T | S |   | A | B | B | E | Y |
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| Y | O | U |   | I | N | T | R | O |   | P | A | S | T | A |
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| C | O | T | T | O | N | C | A | N | D | Y |   | O | F | T |
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| S | C | O | N | E |   | E | L | A | N | S |   | S | Y | N |

# *prof*QUOTES

"If I can prove this claim, I'm a winner. Actually, I'm a winner anyway."

McKinnon, MATH 147

"If you're comfortable with squares, I'll change those to threes, and if you're too comfortable with that I'll change it to 97 and then I know you're screwed."

McKinnon, MATH 147

"Life is uncertain. Eat dessert first."

McKinnon, MATH 147

"Whoa, hang on, you can't eat all the dessert first."

McKinnon, MATH 147

"That's a nice intuitive reason for it, but it's crap."

McKinnon, MATH 147

"Some of you guys might be familiar with the movie the Godfather. Do you remember the scene where the guy wakes up to see a decapitated horse? Well I walked into my office this morning, found a *math*NEWS on my chair, and I felt like that guy."

McKinnon, MATH 147

"To prove there are infinitely many composite numbers, assume there's a finite amount, multiply them up, and don't add one."

McKinnon, MATH 147

"There's a thing about being in number theory: sometimes you forget 2 is prime."

McKinnon, MATH 147

"It's a stupid triangle, because it's a triangle that's flattened on one side, but it's still a triangle."

McKinnon, MATH 147

"I say 'other half of the proof' like it isn't one sentence."

McKinnon, MATH 147

"You have a subsequence, which has nothing to do with sandwiches."

McKinnon, MATH 147

"Proof: in the book. QED."

McKinnon, MATH 147

"We haven't talked about functions at all in this class yet, which is weird for a calculus course."

McKinnon, MATH 147

"It's the same kind of stupid we've been doing all term long."

McKinnon, MATH 147

"For all elements of the empty set, oh, there's a shortage of those."

McKinnon, MATH 147

"Oh no, I erased my theorem. Bad luck."

McKinnon, MATH 147

"Back in the day...and by back in the day, I mean in the 1800s or so."

McKinnon, MATH 147

"What we basically learned in this module is that everything is broken, and life is hopeless."

Bocovich, CS 458

"I'm assuming that you have some knowledge."

New, MATH 145

"For those of you who haven't seen complex numbers, four is two times two."

New, MATH 145

"I didn't want the proof to be too boring, so I said "so, hence, so hence, so hence...""

New, MATH 145

"I'm either trying to confuse you, or I'm trying to get you to understand this rule."

New, MATH 145

"I went to China over the summer ... I submitted a receipt, and I got it back with 'wrong date'. Here's what in English: my name, and 70 RMB. Everything else is in Chinese. So can you read it for me?"

Labahn, CS 370

"You've seen these problems in Calculus. You just never enjoyed them."

Labahn, CS 370

"I call my teacher every day. Stalker."

Kunizane, JAPAN 202R

*[After students say okashishimasu (to lend) instead of okarishimasu (to borrow) and okaeshimasu (to return)]*
"Everyone likes to lend money!"

Kunizane, JAPAN 202R

"We call it collusion when it's evil.  Sometimes, it's called co-operation."

Gauthier-Shalom, CO 456

"It's a Canadian stand-off when two people..." *[gestures]* "'You go.' 'No, you go.'"

Gauthier-Shalom, CO 456

"Do you want to play the Nihilist game?  You get a bunch of decisions, but nothing matters."

Gauthier-Shalom, CO 456

"How do I make my q's and 9's different?  [...] I give up, 10 - 1."

Gauthier-Shalom, CO 456

"I like the word 'exercise'.  Things can't go wrong.  Well, I guess I can be safer by saying 'Prove or disprove'; then nothing can go wrong. Well, you might think I'm lazy, so that could go wrong."

Gauthier-Shalom, CO 456

"The two examples we've seen have had a Nash Equilibrium, so clearly, every example should have one."

Gauthier-Shalom, CO 456

"I'll juggle in class.  Maybe you guys will like me."

Gauthier-Shalom, CO 456

*[begins juggling]* "You guys are thinking about this problem, don't watch the juggling."

Gauthier-Shalom, CO 456

*[Returning from break]* "Did anyone figure out the answer?" *[Crosses out board]* "The answer is I misled you there."

Gauthier-Shalom, CO 456

"That will handle things like CPU-caught-fire and those types of things."

Buhr, CS343

"You put in print statements, and it works. So you take them out, and it stops working.  So you put them back in, and it starts working again. So you hand in your program with print statements."

Buhr, CS343

"This is for professional idiots, and stunt people."

Buhr, CS343

"The key to undestanding 'atomic' is that it has nothing to do with radioactivity. It comes from Greek: 'at' meaning 'deep fried', and 'omic' meaning 'running shoe' or 'sandal'."

Buhr, CS343

"Busy waiting is a capital crime.  It is the only hanging offence."

Buhr, CS343

"I don't think there's ever been a recorded case of people unconscious, or worse, dead, because people couldn't figure out how to get through a doorway."

Buhr, CS343

"We decide on a system: whenever we use the bathroom, we write our name on the chalkboard. If I look up and I suddenly see Mary's name there..." *[glances around nervously]* "Is she in here with me?"

Buhr, CS343

"Sure, I fell asleep, whatever.  I don't know what you do in the bathroom."

Buhr, CS343

"Every time you walk into a bathroom, it's absolutely unsafe. There could be 100 people in there."

Buhr, CS343

"If you're going to peek at your neighbour's exam, make sure it's the right version."

Banerjee, STAT 231

"Someone can translate this, it's going to be a low Mexican word for urinal or something like that."

Katz, CO 330

"I'm allergic to subscripts."

Katz, CO 330

"Actually, this is kind of an industry in combinatorics. Lots of people put q's in front of things."

Katz, CO 330

"I don't even know if I believe my conjecture, but I made it."

Katz, CO 330

"I'm on crack today, bear with me, gang."

Katz, CO 330

"There must have been a zombie attack when I was writing that in my notes. Either that, or one character cornered another character in an elevator. I must be confusing Walking Dead with Grey's Anatomy, it's so easy to do."

Katz, CO 330

"I have an irrational hatred of people from Alberta."

Andres, PHIL 216

# GRIDXXORD
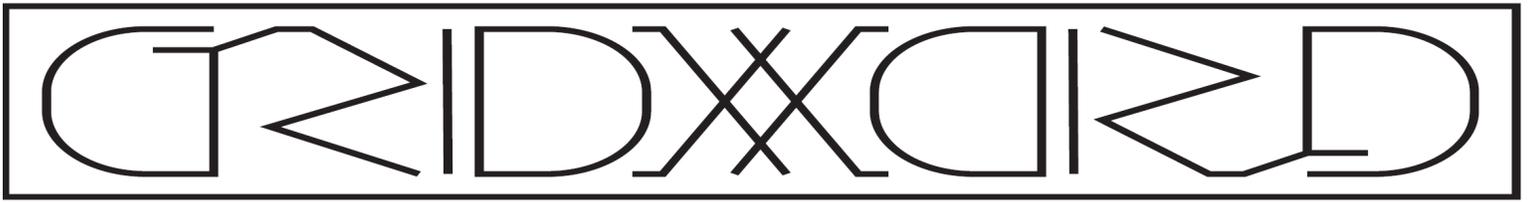
## *grid*COMMENTS

I apologize for last issue's *grid*WORD; it was not one of my best creations and it had a lot of very obscure terms in it. The theme itself wasn't even that strong: **MEDIUM STEAK, JUMBO SHRIMP, COTTON CANDY, WATERMELONS** are all foods that are PINK. Ideally, I was hoping for a silly pink food for breakfast, but instead I chose to go with my favourite answer to the *grid*QUESTION, "What is your favourite food?"

Congratulations to **Narmi**, who really likes "roasted iguana and chilli sauce," which sounds really cool. One of my favourite foods (that I doubt my friends have had) is pan-fried bamboo grub; they tasted like spicy fries in miniature. The chef brought over a cut tube of bamboo to show us how fresh it was, then walked to the pan and pounded on the tube like it was a stubborn bottle of ketchup.

This week, there is no special theme answer. Submissions will be ranked based on how accurately they have filled in the crossword and their answer to the *grid*QUESTION.

Remember to submit your *grid*WORD solutions in the **BLACK BOX** by the Comfy before **6:30 PM on November 2nd**. To decide ties, I will look at your answer to the *grid*QUESTION, "What qualities would your ideal PM have?"

ConvolutED

## This Issue's Grid:
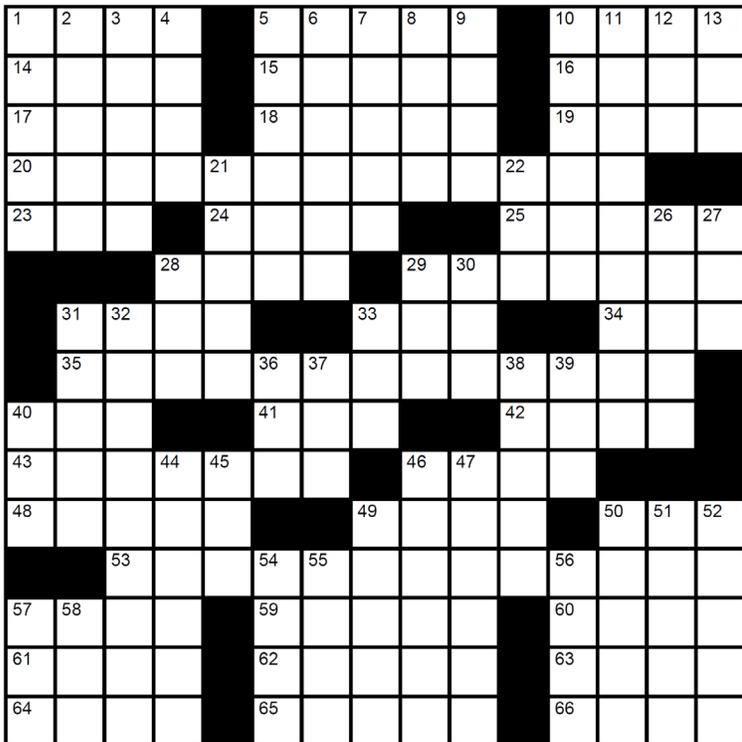
## *grid*CLUES

*Across*

1. Purposes
5. At the right time
10. Ardent
14. Insignificant
15. Matthew from Friends
16. "Fuck it; ____!"
17. Farm team
18. Old Roman omake
19. If-Then complement
20. #1
23. Hadfield home, for a while
24. Apollonic muse
25. Hang
28. Hairstyle of The Fonz
29. Current ruler
31. Dancing garb
33. Uber competitor
34. December party for clubs
35. #2 (at the time)
40. Raphael tool
41. Boole's times
42. Sandwich's noble title
43. Fae monarch
46. Queer community initials
48. One from the largest land
49. "Welcome to Night ____" an awesome podcast
50. Inc. or Co. related
53. #3
57. What antiheros do
59. Criminal excuse
60. Car
61. "Mon ____!"
62. CS 145/146 prof
63. Cheshire Cat characteristic
64. Pablo's pad
65. Iraqi currency
66. Comfort

*Down*

1. Modern pictograph
2. Google tablet
3. Wedding expense
4. Dispatched
5. Unfastened
6. Adjacent
7. Lots of money in India
8. Language in India
9. Observed
10. Sailor's yes
11. Offer to help
12. French pronoun
13. Anonymous Jane
21. Pregnant (like a bitch)
22. Krueger's street
26. Lowest-ranking freeman
27. Upward inflection
28. Salt Lake tribe member
29. Ooh partner
30. CEO degree
31. славный leaders
32. Electricity, water, etc.
33. It has Mac'n'Cheese Monday
36. Solo pilot
37. Purple faculty at UWaterloo
38. 36-Down ally
39. Butter amount
40. Yellow, Red, or Black
44. Black Russian component
45. Odysseus saviour
46. Racket logo letter
47. More sticky
49. Peaceful gesture
50. Lady before the First Lady
51. South American monkeys (Stop giggling; it's not dirty.)
52. Male bee
54. "There all is ____; There lies a cooling card"
55. Jai ____
56. Enclosure
57. Information transfer concern
58. By way of
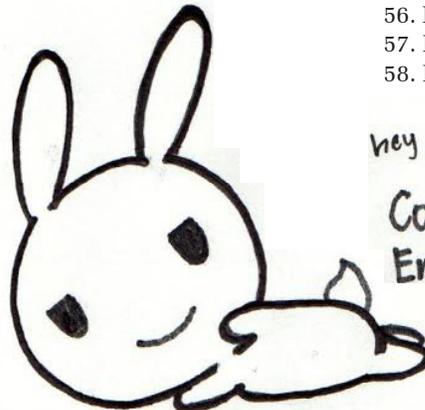
hey good-lookin'!
Contribute articles!
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