

# *math*

# NEWS

Volume 130, Issue 5

Friday, March 11<sup>th</sup>, 2016



**lookAHEAD****mathNEWS**

March 11	Issue 5 gets killed by frost
March 21	Writers huddle together for warmth
March 25	Issue 6 frolics in a field

**MathSoc**

March 14	Pi Day celebrations
March 22	MathSoc General Meeting
March 23	Party with Profs
April 2–3	24-Hour Games Night

**University**

March 18	WD drop period ends
March 19	WF drop period begins
March 25	Good Friday
April 4	Make-up day (Friday schedule)

**Miscellaneous**

March 1–24	Online Celebi Distribution (Pokémon)
March 8	International Women's Day
March 13	Daylight Savings begins
March 15	Everything You Think Is Wrong Day
March 16	Everything You Do Is Right Day
March 17	St. Patrick's Day
March 20	First day of Spring
March 20	Extraterrestrial Abductions Day

**Article of the Issue**

This issue's article of the issue is "Waterloo Introduces New Geese Population Control Measures", written by Kanadajin. Come by our office to pick up your prize!

The Editors

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*Founded 1973*

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George Lambrou (Elise), Amy Li (Lord Garon), Elizabeth Liu (Xander), Katherine Tu (Leo), Jose-Miguel Velasco (Camilla)

**mastHEAD**

Short and sweet today. We had a discussion after Production Night about a certain Reddit post on the UWaterloo subreddit. Although as of right now it no longer exists on that subreddit. How unfortunate for those curious about what it was.

But it did help us think of this week's question for our writers!

This week's *mastHEAD* asks our *mathNEWS* writers: "What did you accidentally send your prof?"

WibbleED ("geofiltered selfies"); Beyond Meta ("A snarky satirical article about them"); ME ("I never use email"); The Undecided ("More wrong exam answers than I'd like to admit."); XoX ("My reactions folder"); Theodore Bear ("The secret of Mak'Abu"); GUNIT ("A list of my Google searches"); Ethu ("My unfinished assignment (not really an accident)"); Soviet Canadian ("The obvious answer. The worst case. My prized collection of every kind of deviant porn"); Hadrön ("My Civ5 hot seat file"); himynameis ("my strange tractor"); Element ("a proof of my non-existence"); Scythe Marshall ("The assignment that they don't want to mark.")

SketchED ("Professors have emails?")

**Dear Professors**

Dear Professor,  
do not fret,  
if your *profQUOTES*  
are not met,

with laughter and  
joyful tears;  
with broad smiles and  
eager ears.

You are funny,  
fun, hilarious even.  
If you don't trust,  
then what do you believe in?

For a *profQUOTE*  
is the eyes of a student,  
deifying  
(subtracting what is prudent).

Your fans aren't the empty set,  
which is what counts the most today in our maths.  
When most of our classmates are  
raised in between multiple humourless paths.

Some remain un-*profQUOTED*,  
and lest any you fret, I caution you thus:  
Only your students are bland,  
and you, Dear Professors, have failed none of us.

## VPI Sez

Wow, we are almost at the end of term! Pop quiz! Can you name two big events happening during March this term?

### Pi Day!

Free pie will be distributed on March 14<sup>th</sup> at 1:59 PM (3.14159)! Pi recitation contest at 2:30 PM! What is better than eating pies and listening to pi recitations at the same time?

### Party with Profs!

March 23<sup>rd</sup> 4:15–7:00 PM at the Bomber. Professors love to be invited by their students. Invitation cards can be found outside (and inside) of the MathSoc office. There will be free food including Bomber nachos, perogies, breaded dill pickles, different pizzas, different platters, and also veggies. These foods are nice, but blending with professors and math staffs is even nicer!

If you would like to volunteer during Pi Day (1–3 PM), please send an email to [vpe@mathsoc.uwaterloo.ca](mailto:vpe@mathsoc.uwaterloo.ca).

Volunteers get a free Pi T-shirt (yay). Our spam blocking system is very good so please use a proper title and email address.

WenYu Xu  
Vice President, Internal

## Prez Sez

Hi Mathies,

Hope your midterms are going well. MathSoc will be holding its termly General Meeting on Tuesday, March 22<sup>nd</sup> starting at 6:00 PM in MC Comfy.

All math students are welcome and encouraged to attend. This meeting is very important for all math students because it's an opportunity to get involved, vote, and speak on matters that impact you.

If you cannot make it to the meeting, you can fill out a proxy form and have a friend attend and represent your vote. They will be available outside the MathSoc office (MC 3038) this Wednesday.

For all those that can attend, there will be free food!

Hope to see you all there,

Alice Zhou  
President

***mathNEWS* Sez:  
"Write More Sezzes"**

## (Just a Regular) Games Sez (No, Really)

To all of you who showed up to Games Night with Profs, thank you for making our event a resounding success! To those of you who didn't, well, you can redeem yourselves by attending our regular Games Nights, which continue until the end of the term.

The end of the term isn't that far off either; it's already week nine of the term! This means it's time for acquisitions! If there are any games that you feel MathSoc should own, or any games we already own that are damaged beyond repair, feel free to make suggestions in the MathSoc office (MC 3038) or on the Facebook group (<https://www.facebook.com/groups/MathSocGamesNight/>) so that we can consider purchasing a (new) copy of these items.

Like the end of the term itself, our end of term event is slowly creeping up on us. As usual, 24-Hours Games Night will take place from noon to noon on the last weekend before exams start; this term, that'll be April 2<sup>nd</sup>–3<sup>rd</sup>. This is the perfect time to play those long games that you could never slot into your schedule (Twilight Imperium, anyone?), or for playing many shorter games with various people, or for playing games you would never play if you weren't sleep-deprived.

As with our regular Games Nights, there's no obligation to remain for the entirety of the event.

Your Games Director,  
a crafty player

## A Poem for the Player

I light up every time you come around  
Your beauty bringing a smile to my face  
But you just play me over and over again  
You disappear  
Just like that  
And suddenly I'm cold again  
Frozen  
Numb  
You're such an asshole  
Honestly  
Get your shit together  
Please  
Are you here to stay or not?  
Fuck you, Spring.

TheUndecided

**Follow us on Facebook  
(*mathNEWS*), Twitter  
(*mathNEWS*)  
or in person (MC 3030)!**

## HeForShe – Let’s Talk (Part 2)

Welcome to a new running column in *mathNEWS* on the HeForShe campaign and how it relates to the goings-on in the Math Faculty. The inspiration is for us to provide a continuous open forum for discussing issues of gender equity as they affect students of the Math Faculty.

In this issue, we talk about the outcomes of the first Math Faculty HeForShe Working Group meeting that was held February 5<sup>th</sup>. The topics of future issues of this column will depend on questions that we receive from you!!! Send us your questions and comments and we’ll do our best to address them. (See contact information at the end of this article.)

The main focus of the Working Group meeting was to discuss ways in which the Math Faculty environment could be improved so that it is more friendly to female students. But as is often the case with such discussions, many of the specific topics and suggestions raised by attendees really aim to make our Faculty more welcoming to all students.

### Psychological Safety in CS courses

By far, the number one issue that attendees raised was intimidation in and about CS courses. There is a huge disparity in the computing backgrounds of incoming Math students. Students who are novices to CS sit in the same first-year programming courses as experienced students. Because Waterloo has the best CS programs in the country (in our humble opinions), some of the more experienced students are truly awesome. And in first year, these students are excited to be around other experienced students, and tend to be keen, and more vocal in class.



## Armband Enthusiasts Club

What a wonderful Friday!

Many of you may have noticed all through the week a large number of armband enthusiasts dashing nimbly across campus. Or not, as the case may be, because they take pride in their stealth abilities! However, it is Global Armband Week! Of course, there are those who insist on wearing headbands instead. These brain-dead corpses are best avoided at all cost. In fact, if you see one, make sure you point them out to arm-banded persons so that they can also run away.

Armbands are better than headbands.

Stubbs  
(Go Humans!)

That said, the playing field is more even than most novice students believe. For one thing, it might not seem like it, but the more vocal experienced students sitting at the front of the class make up a small minority of the class. Most Math and CS students start their university studies with little or no programming experience. Plus, first-year CS courses assume that the students are novice programmers. Moreover, the courses use a functional programming language — Racket — that is wildly different than anything that experienced students are likely to have encountered. With time and practice, the novice students catch up.

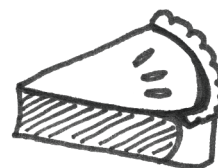
We, as instructors and students, must strive to ensure that the atmosphere in first-year CS courses is more inclusive, where students feel comfortable asking questions and making mistakes when speaking up in class. WiCS is developing some first-year course materials on inclusive classrooms, psychological safety, and micro-aggressions. If you have any other ideas of what to include in these materials, let us know!

The topics of future columns will depend on your questions. What do you want to talk about? Send your questions, comments, ideas, etc. to [mathheforshe@uwaterloo.ca](mailto:mathheforshe@uwaterloo.ca). Anonymous submissions are welcome.

<https://lists.uwaterloo.ca/mailman/listinfo/math-equity-wg>

Jo Atlee,  
Computer Science, Math Faculty HeForShe Advocate

Francis Poulin,  
Applied Mathematics, HeForShe Advocate



## Headband Enthusiasts Club

Happy Friday!

Many of you may have noticed a large number of headband enthusiasts running around campus over the course of this week. Don’t they look sexy sporting their sporty headbands in support of National Headband Week! Much sexier than the wretched armband enthusiasts who have also been running around campus. If you see a armbanded thug, please notify the closest head-banded person so they can engage these poor souls in polite conversation and persuade them to rectify their poor decision making.

Stubbs  
(Go Zombies!)

## Les Mathématiques, en Français

Il y a longtemps, on ne faisait pas les mathématiques en anglais; on les faisait en grec. Plusieurs siècles plus tard, on les fait en arabe, puis en latin (la langue de connaissance du temps), et puis, on les fait en langues européennes, comme l'italien, l'allemand, et le français.

L'anglais est seulement devenu la langue universelle pour publier les articles dans le vingtième siècle. Donc, il existe beaucoup d'articles fantastiques et influents écrits en, par exemple, français.

Et quelquefois, on doit lire ces articles. Oui, c'est un trage, mais quelquefois c'est très intéressant de lire les articles sans traduire. On peut voir, au sens figuratif, la façon dans l'equel les mathématiciens français ont pensés aux maths, parce que les langues sont fortement liées aux cultures.

Cependant, quand on lit les articles français, il faut savoir le vocabulaire mathématiques. Sinon, comment comprendre les démonstrations? Ou même les théoremes. Alors, voici une liste de vocab pour les disciplines différentes, avec des traductions anglaise. Meme si on ne peut pas lire le français, on devrait pouvoir l'imitier.

Regarder bien que beaucoup de mots, pour la plupart, sont presque exactement les même comme en anglais. C'est amusant de voir où les mots ne sont pas du tout le même.

- Les nombres: Numbers
  - les nombres premiers: prime numbers
  - les entiers naturels: whole numbers, natural numbers
  - les entiers relatifs: integers
  - les nombres rationnels: rational numbers
  - les nombres réels: real numbers
  - les nombres complexes: complex numbers
  - un chiffre: digit
- Le calcul: Calculus
  - une fonction: function
  - une limite: limit
  - continue: continuous
  - la dérivée: derivative
  - l'intégrale: integral

- L'algèbre: Algebra
  - un groupe: group
  - un anneau: ring
  - un corps (gauche): division ring
  - un corps commutatif: field

Le mot «corps» c'est à dire que l'objet est «complet», dans le sens que chaque élément non nul a un inverse multiplicatif; par exemple, les quaternions (de Hamilton). Maintenant, on utilise normalement le mot «corps» à la place du «corps commutatif», mais les vieux articles peuvent utiliser le mot avec un sens différent.

- Les démonstrations: Proofs
  - un ensemble: set
  - un théorème: theorem
  - un lemme: lemma
  - soit  $x$  un nombre réel: let  $x$  be a real number
  - un epsilon: epsilon
  - une série: series
  - une suite: sequence
- Autres disciplines: Other areas
  - une variété: manifold
  - une série/fonction génératrice: generating series
  - un graphe: graph
  - un arbre: tree
  - un base: basis

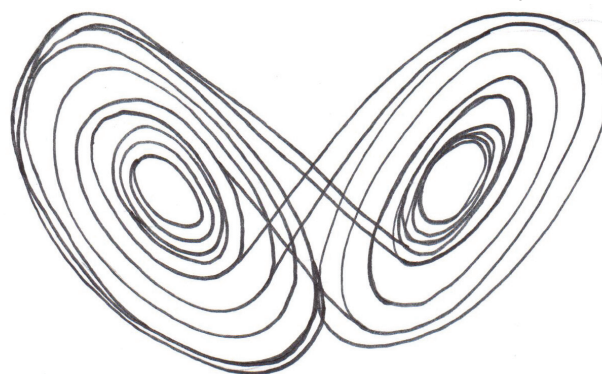
En anglais, le mot variety habituellement est utilisé au sens de géométrie algébrique (comme algebraic variety), donc c'est une autre (petite) différence. S'il y a un graphe qui se compose des arbres, on l'appel une forêt, comme en anglais.

Ce n'est pas une liste entière, certainement, mais c'est un bon endroit pour commencer. Si vous parlez un peu de français, peut-être vous essayerez de lire des articles en français; si vous ne savez rien au sujet de la langue français... comment est-ce que vous lisez cette article? C'est drôle. Peut-être vous voulez apprendre.

Bonne chance!

Scythe Marshall

**Submit your articles in the  
BLACK BOX outside the  
MC Comfy or email them to  
mathNEWS@gmail.com!  
... Pretty please?**



STRANGE ATTRACTOR

## The Cost of a Homogeneous Workforce

Last issue, *mathNEWS* printed an article entitled “The Cost of Forced Diversity,” on page 9, if you would like to go back and refer to it. This is a response to that article. I am going to organize each of my points as a response to the points made in the original article.

Firstly, I wanted to thank anonymous for writing that article. I agree that this is a topic we must be able to discuss openly, and the author has granted me the perfect opportunity to organize one of my (many) incoherent spiels into a well-informed article.

I’ll start with the initial assumption that the article is based upon:

“The current approach for increasing diversity seems to be this: when picking between candidates, give preference to the more diverse candidates. Hire them even though they may be less qualified.”<sup>[1]</sup>[Volume 130 Issue 4, “The Cost of Forced Diversity”]

Superficially, I agree with this argument. Hiring under-qualified individuals for the sake of diversity is both ineffective and in some ways harmful. Fortunately, nearly zero companies are actually doing this. The original article gave some great sources explaining unconscious biases. It has been shown time and again that it is more difficult to get hired when you have a stereotypically black-sounding name. In the STEM field, a similar trend exists for those with stereotypically feminine sounding names.<sup>[1]</sup> The idea behind diversity hiring practices is not to hire the less-qualified-more-diverse candidate, but to hire the equally-qualified-more-diverse candidate. If Tyler and Rhonda are both up for the same position, and are both equally qualified, always hire Rhonda over Tyler.

Furthermore, there are very few companies in Silicon Valley that practice diversity hiring. Part of my job as the Chair of the WiCS undergraduate committee is to find cool companies for the committee to work with. As a result, I spend a lot of time talking to a lot of tech recruiters. While there are some companies that will reply positively by saying that they have a lot of outreach programs to reach a “diverse applicant pool” and minority support within the company, the vast majority of companies will give the non-committal response: “We’re working on it.” If you research the hiring practices of the larger tech companies, you will see a lot of similar language.<sup>[2]</sup> In no way is diversity hiring widespread.

The next point in the article was “The cost for employees”:

“Introducing poor workers into an employee pool will decrease their satisfaction and may result in increased churn. In addition, a company may be afraid to dismiss an under-performing ‘diverse’ candidate for fear of public backlash.”

As for the first point, we have already determined that diversity hiring practices do not, in fact, introduce poor workers into an employee pool, so we’re good on that front.

Furthermore, companies are not afraid to dismiss ‘diverse’ candidates for fear of public backlash:

“Over the past 10 years, 38 percent of female chief executives of the world’s 2,500 biggest public companies were fired, compared to 27 percent of their male counterparts.”<sup>[3]</sup>

We move on to discuss “The cost for the company as a whole”: “[Companies] will operate with the goal of generating profit, and an unqualified employee will have a negative impact on the company’s overall productivity.”

Again, we have determined that diversity hiring practices do not result in hiring unqualified employees. Additionally, research shows that more diverse companies are actually more productive. I<sup>[4]</sup> can give<sup>[5]</sup> several sources<sup>[6]</sup>, showing this<sup>[7]</sup> to be true.<sup>[8]</sup>

The next point in the article was “The cost for other employees of the same minority group”:

“Ashley, who is hardworking and competent, sees Madison get the same position as her despite being unqualified, and begins to wonder whether she was hired based on her skill and merit or because she improves diversity.”

See the counter-arguments provided above.

To address the rest of the points in the article:

“The better alternative to introducing conscious bias is removing discrimination, if any, and make hiring decision based on competency alone.”

The author’s suggestions for removing unconscious biases are pretty good. However, not all companies can afford to run blind interviews, especially for roles such as customer support, where personality and tone of voice are important considerations.

“In addition, the workforce is a reflection of the available labor pool, and minorities are in the minority because well... they’re minorities. The other side of the solution is to improve educational opportunities and give everyone the same chance when it comes to schooling though that is another problem altogether.”

A common misconception about diversity hiring advocates is that we want minority groups to be the majority. That is simply not true. We want a representation that reflects current population demographics. In Silicon Valley’s home state of California, the population of people who identify as Hispanic or Latino (about 38 percent), is actually greater than the population of those who identify as white.<sup>[9][10]</sup> Yet, in occupations such as Computer Programmer, Software Developer, Web Developer and Database Administrator, Hispanics and Latinos comprise only between 5 and 9 percent of those employed.<sup>[11]</sup> Likewise,

## Are You a Programmer or Computer Scientist?

women are, of course, about 50 percent of the worlds population, and we comprise between 20 to 30 percent of those employed in these roles.<sup>[11]</sup>

In the next point, the author has really hit the nail on the head, that access to education in STEM is why we have a lower proportional representation of minorities in these jobs. However, where I and the author differ is the refusal to discuss education inequality within a conversation about hiring diversity. Dismissing education inequality in the context of career inequality is counter-intuitive, since they boil down to being the same issue.

It is human nature to have role models — individuals whom you look up to. They help build your dreams and aspirations. When minority groups are underrepresented in a particular field of study or career path, a subconscious message is sent to youths. They are susceptible to feeling that the subject is closed off to them, or that they might not succeed. Those who feel discouraged eventually do not choose to study STEM fields, meaning that they do not get STEM jobs, and the vicious cycle perpetuates itself.

This article, and the article it is a response to, have barely scratched the surface of these issues. I really recommend that anyone interested in learning more read the links I have referenced and do research on your own time. There are also some great links on the WiCS website, and you can even come to our talks and panels to learn more (shameless plugging).

Fatbox

[1] <http://gender.stanford.edu/news/2014/why-does-john-get-stem-job-rather-jennifer>

[2] <http://www.pbs.org/newshour/bb/how-silicon-valley-is-trying-to-fix-its-diversity-problem/>

[3] <http://www.bloombergvew.com/articles/2014-04-29/why-women-ceos-get-fired-more-often>

[4] <https://www.gsb.stanford.edu/insights/diversity-work-group-performance>

[5] <http://www.ethnoconnect.com/articles/9-business-advantages-of-diversity-in-the-work-place>

[6] <http://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters>

[7] <http://www.businessnewsdaily.com/1787-staff-hiring-diversity.html>

[8] <http://www.forbes.com/sites/learnvest/2014/12/22/why-gender-diverse-work-teams-are-the-most-productive-and-profitable/#60cc83737d1d>

[9] [www.census.gov/quickfacts/table/PST045215/06](http://www.census.gov/quickfacts/table/PST045215/06)

[10] [http://www.huffingtonpost.com/2014/03/23/latino-population-california\\_n\\_5017038.html](http://www.huffingtonpost.com/2014/03/23/latino-population-california_n_5017038.html)

[11] [www.bls.gov/cps/cpsaat11.htm](http://www.bls.gov/cps/cpsaat11.htm)

0. What's your favourite flavour of Linux?
  0. I don't know.
  1. [insert flavour here] is.
  2. There are too many to choose from!
1. Of the following, you would rather program in:
  0. Java
    1. Python
    2. Haskell
2. When computing the average runtime of an unknown Monte Carlo algorithm you:
  0. Run it 10 times and get the average runtime.
  1. Call the developer and ask "Why they hell is it not open-sourced".
  2. Run it 32 times each on 32 different inputs and get the average runtime.
3. A computer you want to use is broken, and you have no admin credentials for it. You:
  0. Find another one.
  1. Reboot to no avail.
  2. Find who is responsible and get them to fix it.
4. You would rather take:
  0. None of these.
  3. CS 444
  42. CS 452
  2. CS 488
5. The following best describes your first year of CS:
  0. Scheme makes me cry.
  1. Easy 100s.
  2. DrBracket is fun!
6. Matlab:
  1. Arrays start at index 1.
  0. Arrays start at index 0.
  - 1. Please no.
7.  $2^{33}$  bits is:
  0. 1 gigabyte
  1. Not enough.
  2. Around 10,000,000,000 bits.

If you scored below 0, congratulations! You are 100% not Computer Scientist material!

If you scored between 0 and 6, you are probably going to be a programmer.

If you scored between 7 and 11, I dunno, finish your degree and figure out your own life.

If you scored between 11 and 16, welcome to academia! My condolences.

If you scored above 16, nice try, but I know you are really a train.

# An Idris Tutorial

It has come to my attention that the programming language Idris<sup>[1]</sup> exists, and is pretty dank.

Idris is, and I am totally not shamelessly plagiarizing this from Wikipedia, a general-purpose, purely functional programming language with dependent types. If you want to know what general-purpose means, get a dictionary. If you want to know what a purely functional programming language is, ask somebody who knows Haskell.<sup>[2]</sup> If you want to know what dependent types are, well, read this article!<sup>[3]</sup>

Now, if this description does make you care, you're probably wondering how this language differs from all the other programming languages (or proof assistants, or, more generally, things that try to blur the boundary between programming languages and proof assistants<sup>[4]</sup>) that fit the exact same description!

It differs from Coq in that you don't waste any time trying to think of witty puns that you never end up actually saying anyways.<sup>[5]</sup> It differs from Agda in that it doesn't support Unicode, so unfortunately you can't summon our dark<sup>[6]</sup> overlord Zalgo, and neither can you reason about His properties.

It also differs from Haskell in several aspects. And because, unlike Coq and Agda, I actually know Haskell, I will try to explain those aspects:

Firstly, of course, while Haskell was developed by the Dank Computer Science Illuminati<sup>[7]</sup>, Idris was hacked together by some guys in a basement. This means that if your Haskell program is too slow, a dozen PhDs<sup>[8]</sup> have already worked on your problem, and didn't figure out a suitable GHC extension, so you're completely fucked. On the other hand, if your Idris program is too slow<sup>[9]</sup>, this means that this guy forgot to implement arrays or something, so you're completely fucked.

Secondly, Idris completely forgoes the separation between how types work and how everything else works. For example, everything in Idris has a type, and types just have the type `Type`<sup>[10]</sup>. Also, you can just pass around types like any other thing! For example:

```
> myFunctionThatReturnsAType : Bool -> Type
> myFunctionThatReturnsAType False = Nat
> myFunctionThatReturnsAType True  = Char
```

Also, I can just call functions inside a type signature, to let the compiler find out which type I want!

```
> myNumber : myFunctionThatReturnsAType False
> myNumber = 420
```

This example is pretty useless, since we could have just written `myNumber : Nat`. But there are cases where this kind of thing is very nice to have around, namely when you want the type of something to depend on something else.

For instance, it often makes sense to have the type of the return value be dependent on the input that the function was given. For this, Idris introduces a more general notation for the type of a function. While in Haskell, you can only write "`A -> B`", where `A` and `B` are type expressions, to mean "a function that takes something of type `A` and returns something of type `B`", in Idris, you can also write "`(x:A) -> B`", where `A` is a type expression, `x` is a variable name, and `B` is a type expression that may involve the variable `x`, to mean "a function that takes some `x` of type `A` and returns something of type `B`". This probably sounds pretty abstract<sup>[11]</sup>, but here is an example:

```
> myNumberOrChar : (b : Bool) -> myFunction-
ThatReturnsAType b
> myNumberOrChar False = 69
> myNumberOrChar True  = 'x'
```

You can also use this notation to introduce polymorphisms into Idris! For example, for every type, you can get the identity function for that type the following way:

```
> idForAType : (t : Type) -> (t -> t)
> idForAType t x = x
```

But wait, don't we already have polymorphisms in Haskell? Yes we do, but in Idris, it is way more explicit how polymorphism works, which is something that I personally find pretty nice. But of course, in Idris, we can also make it less explicit if we want, by using implicit arguments. Implicit arguments are arguments to a function that you don't actually give to the function, but where the compiler figures out some value it could give to the function. We declare those arguments by writing "`{x:A} -> B`" instead of "`(x:A) -> B`". So we get:

```
> id : {t : Type} -> (t -> t)
> id x = x
```

Then, if we evaluate `id 'a'`, the compiler automatically figures out that the implicit argument `t` must be `Char`, so this is equivalent to saying `idForAType Char 'a'`.

Now how are those dependent types actually useful? You can use them to encode guarantees about your code that are even stronger than the ones that type systems like Haskell offer you. For example, `Vect n a` is a data type for a list, while `List a` is also a data type for a list, but while a `List a` is just a finite list filled with `a`'s, a `Vect n a` has to be a list filled with `a`'s that has exactly `n` elements. We can now encode information about the length of lists in the types. For example without dependent types, we would get functions with a type signature like this:

```
> append : List a -> List a -> List a
```

But with dependent types, we get a function with a much more descriptive type signature like this:

```
> append : Vect n a -> Vect m a -> Vect (n + m) a
```



## N Assumptions In “The Cost of Forced Diversity”

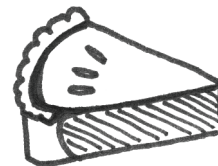
How this works is something that I might explain in another *mathNEWS* article.

Dank

- [1] You pronounce it like the word “Idris”.
- [2] Or somebody who overuses the letter lambda. Or your CS145 Prof. Or all three of those at the same time.
- [3] ... and after that, look it up on Wikipedia, because my explanations are probably really horrible.
- [4] By the way, did I tell you that Idris tries to blur the boundary between programming languages and proof assistants? Because it totally does, and actually this might even be a better description of Idris than the totally-not-plagiarized sentence I just wrote!
- [5] What, you are telling me that you never try to, uhmmm, interpret the word Coq in different ways? Are you telling me that you never fantasize about making other people think that you are not into math, but into roosters?
- [6] and dank
- [7] Don't confuse them with the Dope Computer Science Illuminati, who are responsible for rigging the C++ and Java standards documents to have approximately the same number of pages.
- [8] Those PhDs have, of course, become sentient while their holders were busy writing Monad tutorials.
- [9] In which case: Congratulations for being able to successfully typecheck it, and double congratulations for actually running their program!
- [10] Please don't ask me what the type of `Type` is. Just don't. Just go away. Why are you reading those footnotes anyways? They aren't even numbered!
- [11] It also might sound like it is written at 3:00 AM by somebody who tries to cover up that they have no idea what they are talking about by using completely random absurdist humour, self-deprecation and self-reference (self-referentialness?), but this is an impression that has absolutely nothing to do with how this article was actually written.

- Bulbasaur is the best starter
  - STAT 231 is fair and balanced
  - Companies give preference to the more diverse candidates
  - Use node.js
  - Tech companies are under enormous social pressure to improve the diversity of their work force
  - Zombies probably won this term didn't they
  - Axiom of Choice
  - There is an objective measure of merit
  - There is an objective measure of merit and it can be measured by recruiters or interviewers
  - Nobody knows about the secret Environment coffee shop
  - There is objective truth
  - There is — oh whoops there was an article in that issue that told me to number my “N Things” list
15. Well might as well start now
  16. The sum of all natural numbers does not converge
  17. The sum of all natural numbers converges to  $-1/12$
  18. Ashley's R&D department isn't like 90% men already (okay the article didn't actually say *this* one)
  19. Ashley isn't 103% happy HR finally put a Madison with her in R&D to break up the sausage pit
  20. They can't possibly have all five pieces of Exodia in their hand, no way

pjtwo



## Waterloo Introduces New Geese Population Control Measures

A recent report by the city has found that the population of geese exceeds that of the total number of people residing in the city. At about two-to-one, a number that includes the temporary residents from the universities, the human population is absolutely dwarfed by the number of geese in the city.

Referring to this as an invasion waiting to happen, the city councillor in charge of native species and the environment has proposed a new law that will enable citizens to apply for special permits allowing them to hunt geese for sport.

This permit additionally allows citizens to purchase a special type of goose rifle, which is specifically tailored for hunting geese.

In addition to the new permit, the city has created a new department called “The Department for the Management of Invasive Species”, which will coordinate routine geese extermination efforts.

“I'm gonna get 'em, you can trust me,” said department chief Branta, who made a point of emphasizing that he was a person just like us, as he wiped his bill with a hankkerchief.

However, to date, his department has given out no permits, and remains inconsistent on the number of geese they have exterminated.

But Branta remains adamant that his department is effective. “I came in for a permit, and they told me that their system was down,” said local resident Markov. “He told me not to get my wings all feathered up, and that they were planning on getting it fixed later in the month.”

“Rest assured, we will be passing out permits in no time,” said Branta. “Now excuse me, I have a 5 o'clock in the pond over there.”

Kanadajin

## Waterloo's New Mathematics Program – “Entrepreneurial Computer Science”

Citing the recent expansion of the Velocity garage, the introduction of a Data Science program in the upcoming years, and the “Spirit of Why Not”, the Mathematics Faculty has begun the development of an “Entrepreneurial Computer Science” program. This new program will award a Bachelor of Computer Science with a focus on developing technology companies. Unlike the Double Degree program which focuses on core business and computer science values, the new program will focus on helping students develop the skills needed to deliver a Minimum Viable Product (MVP).

This came after a meeting with stakeholders, companies, and students who voiced concerns about remaining competitive in the labour market, spurring business in Ontario, and focusing on delivering the skills students want.

The administration had this to say about their motivation: “Waterloo is a school rich in technologically brilliant students. Why limit them by making them take courses about data structures or algorithms when a lot of students don’t need it for the work they’ll do when they graduate?” A student had this to say: “I really think this is a move in the right direction. I don’t understand why we have to learn Racket or algorithms when you can look up all those things on StackOverflow anyway.”

An early look at the course list shows that the faculty understands what is important. A new course, BUS116, focuses on teaching students how to choose a co-founder and pitch their idea.

For students in the “Entrepreneurial Computer Science” program, CS135 and CS136 have been replaced with CS139, “Developing Web Applications”, and CS139L, “Web Scale: MongoDB and You”. Mobile applications, a bit too difficult for first year, will be covered in upper-year courses.

When questioned on whether or not the faculty was worried that these new students would be more inclined to drop out to pursue their startups, the administration did not seem concerned. “We don’t really imagine any student will stay in the program past second year,” they said. “They’ll most likely join Velocity and later move to the Valley, and that’s fine. We want to give them the skills to be successful.”

The city seems to echo that sentiment. With Google expanding their office in Kitchener, and other growing startups like Pebble, the “Silicon Valley of the North” is increasingly growing their roster of attractive employment options. It may not be too far off before our startups stay home. University of Waterloo President Feridun Hamdullahpur was very supportive of the program. “Truly, ideas start here,” he said, “and hopefully they stay here too.”

IdeasStartHere

## Doused in the Fountain of Youth – The Never Ending Struggles

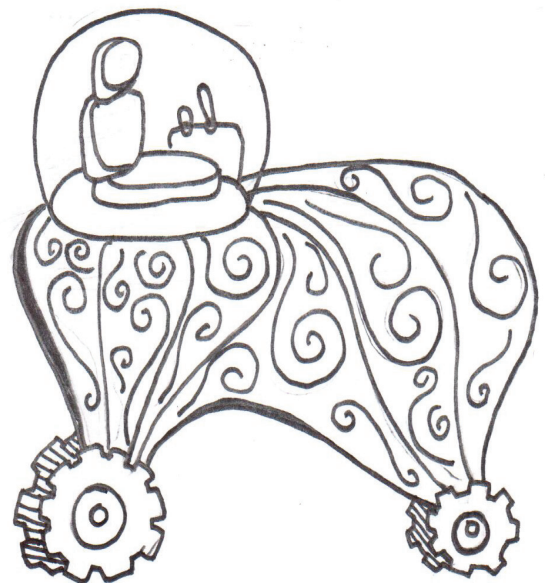
The curse of looking too youthful. Even in a school filled with people of a similar age, you will still get mistaken for being two years younger than you really are about 90% of the time. Somehow, your own family members who you have grown up in front of are still confused and shocked at how old you are, which is both impressive and pitiful. Year after year, you give them a recap of your life and goals and year after year they ask what grade you are in. You meet new people your age and they talk to you like you haven’t experienced life yet when you have done all of it and a helluva lot more. And then there’s going out into the real world and getting carded everywhere you go and then still being turned away. Or a personal favourite: getting offered the kids menu at a restaurant when you’re out with friends your age who actually look like their goddamn age. For now you may suffer, but 10 years from now when everyone starts to worry about their imaginary wrinkles, you will come out looking like a winner even as the waiter hands you the kids menu.

### Survival Tips to Looking Older:

- Walk around with a cane
- Invent lotion that gives you wrinkles
- Start convincing people you’ve skipped a couple of grades and that you’re actually a 12 year old genius
- Tell them you are Blake Lively in Age of Adeline and [Spoiler Alert (for the 0 of you who are trying to watch this movie)] you are waiting to get struck by lightning
- Tell them you’re actually 80 year old and aging backwards à la Benjamin Button and make them feel bad about your imminent death
- Wear some socks with sandals and call it a day

Sincerely,

A youthful looking GUNIT



A STRANGE TRACTOR

## Study Finds Candy Soluble In Air

**Waterloo** — A group of scientists at the University of Waterloo is to release a groundbreaking paper about the newfound solubility of candy in air. For a few years, candy has been a feature in the Mathematics Society office, and many of the workers in the office have noticed that occasionally the candy is all gone by the end of the work day. A research permit was submitted to the Faculty of Science at the University of Waterloo, with a grant from the UWaterloo Mathematics Society and was granted earlier this year.

The study consists of various experiments, but they all followed the same format. An assortment of candy is placed into a glass receptacle in the morning of each day, then the lid is removed. At the end of the day, the remaining solid mass of the candy is carefully measured, and compared against the solid mass placed in the jar in the morning. This procedure was to be repeated several times to account for uncontrollable variables which may affect the solubility such as ambient temperature, barometric pressure, and the specific composition of the used candy.

“The results were astounding,” a researcher, who wishes to remain unnamed, remarked. “On a good day, all of the candy would have dissolved long before the day is over, but even on a bad day most of the candy would have been dissolved”.

The applications of this paper is wide-spread; this could change how candy is sold in stores to minimize shrinkage. This could also open new development to extract already-dissolved candy from the air. Who knows where the state of candy in our world will be in ten years?

The researchers have admitted that the data is preliminary; there are many avenues to improve upon. For example, a more controlled environment could be implemented — being able to calibrate the atmospheric pressure and temperature to study the specifics of the mechanism would be most useful. In addition, occasionally, it has been noticed that third parties who enter the office occasionally like to interact with the candy. Since these third-party interactions only occupy a minority of the time and were not a part of the model, their effects were ignored and a closer analysis of these interactions is worthy of a future research grant.

Zethar

**Submit your articles, *prof*QUOTES, or *grid*WORD solutions to [mathNEWS@gmail.com](mailto:mathNEWS@gmail.com) or the BLACK BOX near the MC Comfy Lounge.**

## How Ready Are You For Pi Day?

- Do you know when Pi Day is?
  - Of course. I've been counting down the days since the last Pi Day.
  - Yeah, it's 3/14. Oh wait, that's pretty soon, isn't it?
  - What's Pi Day?
- How many decimal places of pi do you have memorized?
  - I broke math, and I've memorized all of them.
  - Five, only because I remember them from the Orientation Week cheer.
  - Both of them.
- What have you done to prepare for Pi Day?
  - I've been baking pies for the last 3.14(ish) weeks, practicing my recitation of pi digits, and ironing all my terrible pi pun t-shirts.
  - I wrote myself a reminder to grab some free pie.
  - I didn't realize people actually prepared for Pi Day...
- How many pi-related t-shirts do you have?
  - I had four but I cut one of them into a crop top so that I have pi of them #genius
  - I just have the one from last year's Pi Day of the century.
  - None.
- Complete the sentence: “Pi puns are...”
  - The meaning of life.
  - Funny in a really cheesy way.
  - The reason I hate math.

### Results:

Mostly As: You are so ready for Pi Day. Good for you. You go, Glen Coco.

Mostly Bs: You're approximately 3.14 % ready. GET PUMPED.

Mostly Cs: Get out. You're not even a mathie, are you?

TheUndecided

## How to Find the Best Erotic Novel

So picture this: you are hanging at the library with nothing to do and decide to check out the erotic paperback section thinking it would be fun to read some racy sex scenes. Unfortunately, you don't know which erotic novel you should pick up. You are aware that Fifty Shades of Grey is a bad example and consider perhaps looking for the most muscular man on the covers.

As it turns out, there exists a better methodology for finding the most titillating, orgasm-inducing scenes — you simply look for the paperback with the most pronounced creases. The visible creases are where you can find all the sex scenes in the novels. Note that this only works for erotic novels found at the library or a secondhand bookstores.

Now go ahead and explore your fantasies.

Beyond Meta

**profQUOTES**

“This blows up like a Star Trek explosion.”

Wagner, MATH 259

“Should I mention that the proof was later found to be wrong?”

Jao, CO 487

“If you didn’t get the grades you expected on the midterm, don’t worry: Midterms are like bears. If you are chased by a bear, you don’t have to run faster than the bear, you just have to run faster than your friends.”

Wagner, MATH 259

Prof: *[starts coughing]*

Student: “Don’t die.”

Prof: “Don’t die? You haven’t had your midterm yet! I can’t die.”

Buss, CS 365

“This argument is very clever. I can say this because I didn’t come up with it, so it doesn’t sound like I’m bragging.”

Marcoux, MATH 148

“Number eight: there is no number eight.”

Lhoták, CS 444

“ML is great as long as you don’t make any mistakes.”

Lushman, CS 442

“You are free to read or ski on reading week. Or, if you want, code a compiler; it’s your life.”

Lhoták, CS 444

“Curry’s paradox is how Curry destroyed Church.”

Lushman, CS 442

“Feel free to do whatever you want; feel free to shoot yourself in the foot.”

Lhoták, CS 444

“Occasionally—and by occasionally I mean it might happen on an assignment[...].”

Lushman, CS 442

“Write about it in your report: ‘Oh yeah, that was really clever’, or ‘That didn’t work; I told you so.’”

Lhoták, CS 444

“If you don’t like lambdas, I’m going to ask what you’re still doing here.”

Lushman, CS 442

“Hopefully you’ve seen comma before.”

Lhoták, CS 444

“I might be in the wrong time zone for business-hour questions, but if you’re studying late at night, I might be in the right time zone.”

Jao, CO 487

“I was looking for any old answer. Any answer will do because I’m going to discuss how any answer is wrong.”

Lhoták, CS 444

“I never taught MATH 135, so I don’t know how badly they screwed up.”

Jao, CO 487

“Has anyone ever written a C program? No-one? Good.”

Lhoták, CS 444

“YouTube is half the Internet.”

Jao, CO 487

“Java wants us to answer undecidable problems. If you want to write a Java compiler, it’s impossible. That’s not good; you need to write a compiler by the end of the term!”

Lhoták, CS 444

“Anyone see the problem? [...] Well, I don’t see what the problem is either.”

Jao, CO 487

“I know it, but I won’t sing it; I have mercy for my students. You may think I’m cruel, but I’m not that cruel.”

Seljak, RS 121

“This slide is just to scare the people who don’t come to class.”

Jao, CO 487

*[On the story of Abraham sacrificing Isaac]* “Scholars say it must have been before he was 13, because after 13, it wouldn’t be a sacrifice.”

Seljak, RS 121

## Why You Should Play League of Legends in the Library

“You are worthless. That’s actually my parenting style. ‘You are worthless, you call those dishes clean?’”

Seljak, RS 121

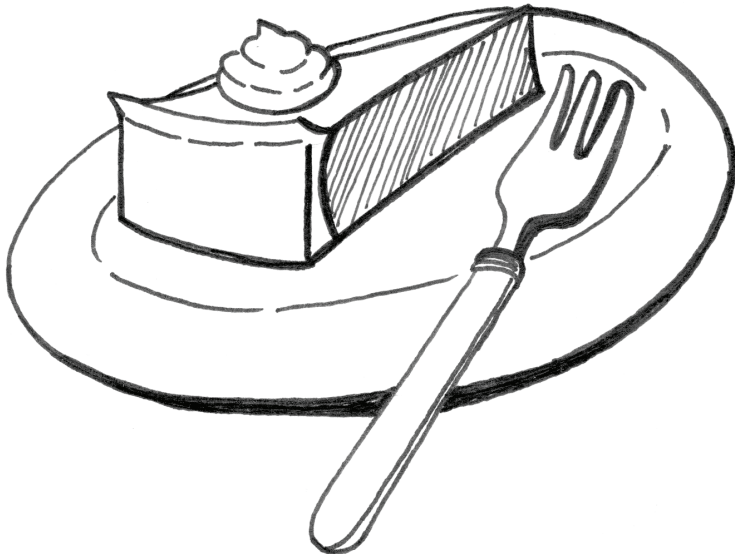
“I’d ate a dog, I hear puppies are delicious.”

Seljak, RS 121

“Have you ever had a pet pig? They’re great because you can eat them when you get hungry.”

Seljak, RS 121

## HAPPY PI DAY, DEAR MATHIES!



3.1415926535897932384626433832795028841971693993751  
058209749445923078164062862089986280348253421170679  
821480865132823066470938446095505822317253594081284  
811174502841027019385211055596446229489549303819644  
288109756659334461284756482337867831652712019091456  
485669234603486104543266482133936072602491412737245  
870066063155881748815209209628292540917153643678925  
903600113305305488204665213841469519415116094330572  
703657595919530921861173819326117931051185480744623  
799627495673518857527248912279381830119491298336733  
624406566430860213949463952247371907021798609437027  
705392171762931767523846748184676694051320005681271  
452635608277857713427577896091736371787214684409012  
249534301465495853710507922796892589235420199561121  
290219608640344181598136297747713099605187072113499  
999983729780499510597317328160963185950244594553469  
083026425223082533446850352619311881710100031378387  
528865875332083814206171776691473035982534904287554  
687311595628638823537875937519577818577805321712268  
0661300192787661119590921642019893809525720106548586

There are a lot of people who complain about individuals playing League of Legends in the library or similar places. They will all cite things like the obnoxious clicking, the loud whirring of a computer fan, or the muffled swearing as your ADC throws the game for the fifteenth time.

However, these arguments miss the clear point of why playing League of Legends in the library is an essential right of every UWaterloo student.

As a student, we pay for the right to use these facilities. While one might say the library is a place for quiet study, working on assignments, or on group projects, who is to say the library is also not a place for League?

The library does provide computers, and I guarantee you someone is there watching the latest cat video hit on the Youtubes or listening to Eminem drop spaghetti rhymes.

What makes League different? Does League not have video? Does League not have sound? And what about those of us who cannot afford the privilege of high speed internet at home? The library is the last refuge for us to play League. Would you argue that this is the price we pay for not being “rich”? Should poor people not be allowed to have entertainment in their life because they have to put money towards bills, travel, and food?

League of Legends is also a social game. It necessitates good communication skills and interaction. Should a social game really be played at home in the confines of one’s room with the blinds pulled down and sweatpants pulled on? I think not.

It would be akin to creating art locked away in a convent, devoid of the beauty life has to offer. The social energy of the masses positively influences one’s performance as a player.

So I say to you, playing League of Legends in the library is a god-given right and anyone who tells you otherwise is clearly a scrub.

PLAT5

## N Things You Definitely Don’t Want Pi Of

- Servings at restaurants. Partially eaten food? No thanks.
- Bills or coins. Can’t spend ‘em if they’re not whole.
- Exams. We would prefer zero exams. Thanks.
- Arms. Having pi arms could be handy, but it would also be terrifying.
- Humans. I don’t even want to know what that would look like.
- Stab wounds.

TheUndecided

## The Search for the Ancient Stone Pt. 5

*The following passages were directly transcribed from the journals of Theodore Bear.*

### Day 75

I made my way through the tunnels that lay beneath the Sydney Opera House. Who knew that Australia had an underground system of tunnels that put Paris, Italy, and London to shame? Even getting down there was perilous indeed. The Dark Hegemony had their secret agents patrolling the perimeter of the Opera House, waiting to intercept me and take the Jubilant Augur for themselves. Thankfully, getting past their guards wasn't too hard. A performance of the opera *Tosca* was on that night, and I had obtained a ticket: my entrance into that lair.

The atmosphere was ritzy and joyous. None of the patrons knew the danger that lay beneath their feet. I was in my tuxedo, and blended perfectly with the crowd. Without breaking my cover, I kept my eyes open, and managed to identify several Agents of the Dark Hegemony who were posing as members of the crowd. I knew I still had to be careful. Silently, I made my way past security, backstage, where the entrance to the underground passageways were. The opera had started, so the sounds of Italian singing and arias filled the halls. When I reached the door that would lead me to where the Ancient Stone was being kept, I found only disappointment. The Dark Hegemony had anticipated my arrival, and had stationed three guards outside the entrance to the underground. I was prepared though; I took out my silenced pistol, and shot all three before they could raise any alarm.

I put my pistol away, and finally went down into the underground tunnels. They wound their way underneath Sydney Harbour, and the city itself, twisting round and round as they winded deeper and deeper. While I walked through them, I thought about the revelations I learned. Who knew that Ancient Stone of Nioj lay beneath such a world-renowned landmark? Who could have guessed that the Dark Hegemony was behind it all, much like Palpatine? Who would have known the true power of the Ancient Stone of Nioj? I thought about how I learned all this stuff, and made a mental note to include the entries for the previous days after this current journal entry. I love using In Medias Res.

### Day 67

I have arrived on the continent of Australia. This country has a long and varied history. I have learned that the final piece of the Jubilant Augur is hidden deep inside Ayers Rock. I quickly rented a car and made my way across the outback, heading towards my destination. It has been several months since I have seen Canadian soil, and the heat of the outback is making me nostalgic for those cool Ontario mornings. But still, I must press on. The Ancient Stone is calling to me.

### Day 70

I have finally learned the truth about the Ancient Stone of Nioj: it is actually *[Editor's Note: Several of our editors went insane after reading this next paragraph, so, for the good of humanity, we must keep the Ancient Stone's secrets secret — wibbled]*.

The Dark Hegemony is now after me. With all the pieces of

the Jubilant Augur, I can finally access get the Ancient Stone, and protect humanity from those who wish to use its power for evil. However, it puts me at risk. The Dark Hegemony wishes to control the world, and they will not hesitate to kill me if it means achieving their goal.

### Day 75... again.

After I had thought about all that had passed since I first started piecing together the Jubilant Augur, I continued making my way through the tunnels. That's when I reached a junction. I could either go left or right. I opened the Book of Ancient Secrets I discovered, and started trying to figure out the puzzle. After a few seconds of banging my head against it figuratively, I decided to do so literally, which turned out to be exactly what I needed. The secret opening activated by a switch hidden inside a rock opened up for me, and I went down. Going even deeper, I was confronted by another choice—another left or right decision. I decided to turn right, which resulted in me almost being possessed by a demonic honey badger, and fighting off a lot of scorpions. I wondered how someone was able to transport thousands of scorpions to the tunnels underneath Sydney and decided that whoever did it must have been very dedicated to their job.

After that, I decided to choose left, which was the correct path this time. Since the paths were alternating, I chose to head right at the next junction, which turned out to be the right idea.

That's when I exited out into a giant circular cavern. It was just like the one I found in the Lost City of Uber. However, this time it was occupied. The Dark Hegemony already had people stationed there; people whose guns were now trained on me.

A young Asian woman stepped out from behind the soldiers clad in black. "We meet again, Mr. Bear," she told me. I recognized her instantly. It was Catherine Ut, the evil clone of *mathNEWS* editor Katherine Tu (you know she's evil because her name is spelt backwards). Why she was working with the Dark Hegemony, I still didn't know. Her motives were just as mysterious as her origins.

"Catherine," I said to her. "I didn't think I'd see you again after what happened in Prague."

"You got lucky in Prague, Bear," she told me. "Now, hand over the Augur, and take us to the Ancient Stone." I held up the Augur, ready to smash it the moment I saw one of their fingers twitch. "Never."

Suddenly, my phone started playing the opening to the song "Roundabout" by the British group Yes (They also did Owner of a Lonely Heart), and I wondered how I would be able to get out of this mess, retrieve the Ancient Stone, and save the world from the Dark Hegemony, or if I even could do all of that, let alone escape with my life.

*Don't miss the thrilling conclusion of Search for the Ancient Stone, coming in mathNEWS v130i6.*

## March Madness Theatre Version

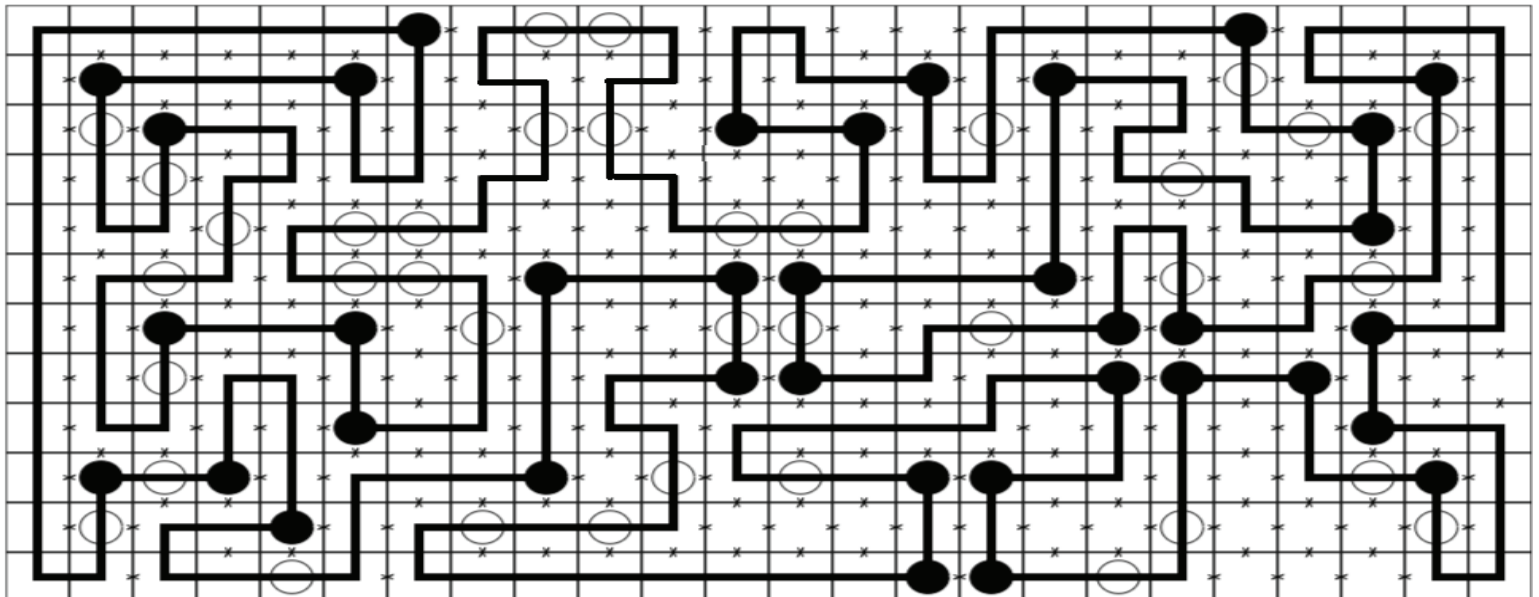
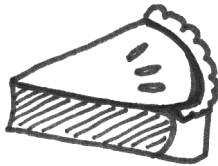
This Saturday at 2 PM and at 7:30 PM in Kitchener-Waterloo Little Theatre, March Madness performances will begin. March Madness is a theatre competition where four or five teams are given the exact same script and a week to prepare a performance. The script is, by design, chosen to be extremely open to interpretation.\* This allows each group's director the opportunity to implement a unique artistic vision, making the script their own. Seeing different interpretations of the same script is super cool. Last year, with identical scripts you had groups performing a horrible dinner proposal gone wrong, a science-fiction prison breakout, a superhero gathering and an old man's birthday party.

I participated in March Madness last winter and it was one of the highlights of my year. While I have not seen this year's script, I can already tell you that it is amazing. I know this as it narrowly bested my script, which is perfect, according to Scythe Marshall. The 2 PM performance is pay-what-you-can. The 7:30 performance is \$15, although it is extremely likely it will be completely sold out.

If you cannot come out this year, you should definitely do so next year when my script will be chosen.\*

Beyond Meta

\*My victory is TOTALLY guaranteed and I am in NO WAY disappointed in losing this year.



## gridSOLUTIONS

To those who missed my Masyu last issue, feel free to stop here and go give it a try if you like logic puzzles. For those who felt frustrated by my unclear instructions, I'm sorry, I'll do better next time. For those who finished the puzzle...I'm sorry, I'll do better next time.

Below is the solution path for the puzzle.

As the instructions said, starting by going right from the top-left corner, the right turns of the path spell:

DECODE UNUSED SQUARES WITH VIGENERE KEY  
LOVELACE

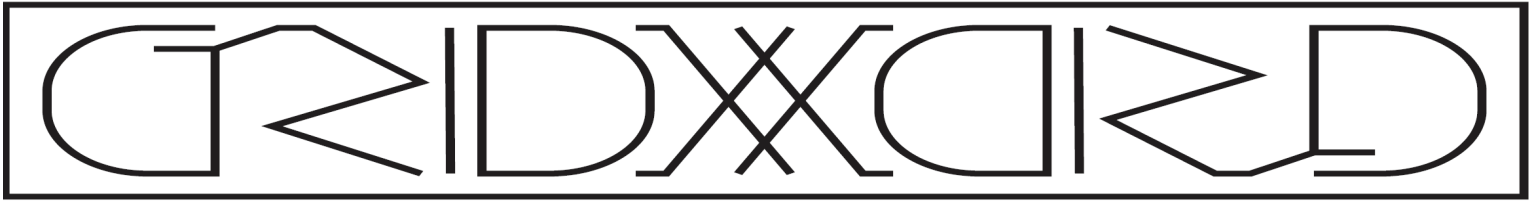
Reading the squares not on the path, from top-to-bottom and left-to-right, and decrypting with a Vigenere cipher with key "LOVELACE" gives:

GO OTHER WAY AND ROT THIRTEEN RIGHT TURNS

Finally, reversing along the path, the right turns (which used to be the left turns) spell, after ROT-13:

NAME OF MAN WHO RUNS ADALOGICAL AENIGMAS

A quick Google search leads quickly to PAVEL (Curtis) of [www.pavelspuzzles.com](http://www.pavelspuzzles.com), who runs Adalogical Ænigmas, a monthly series of logic puzzles with hidden messages, written as the Countess of Lovelace might have.



## gridCOMMENTS

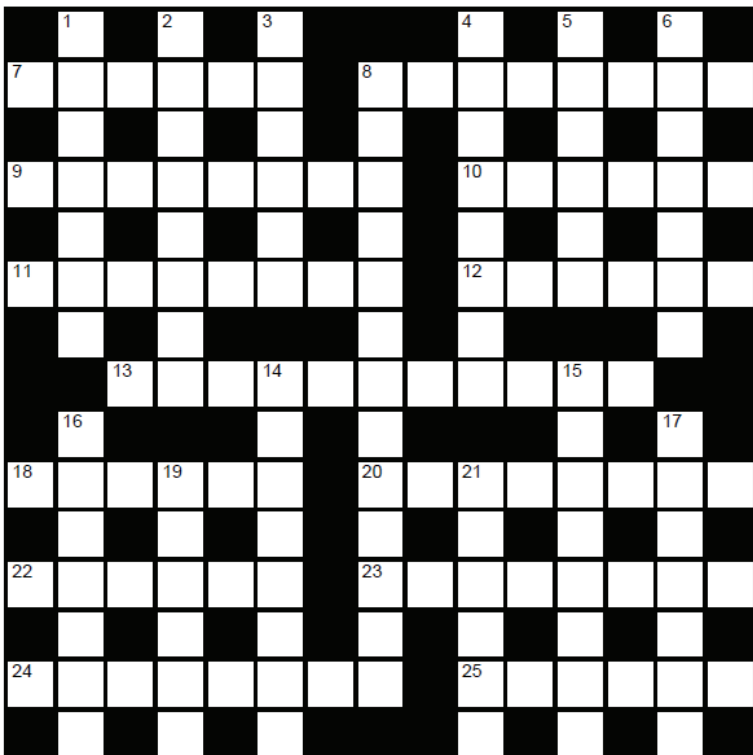
Let no-one say that I do not listen to my audience. I asked for suggestions or guidance as to what puzzles you wanted on the back cover of *mathNEWS*, and you delivered!

And by “you”, I mean Igor Bark, who made the single correct submission of PAVEL to last issue’s puzzle. Congratulations, Igor; your prize is doubled, because I have given you an additional gift, more than just the prize you can pick up from the *mathNEWS* Office at MC 3030.

The additional gift is following your suggestion, Igor. You requested a cryptic crossword, and by my name as ConvolutED, I will deliver a cryptic crossword with a cryptic theme. There is no final secret message to this puzzle; to enter to win this issue, submit your (possibly partial) solution to the **BLACK BOX** by 6:30 PM on Monday, March 21<sup>st</sup>. Ties will be determined by my favourite answer to this issue’s *gridQUESTION*: “Do you even code?”

Do you want me to make more logic puzzles or more word puzzles? Do you have a suggestion of any kind (puzzle type, hidden message, encryption) for next issue? Then please leave any comments, suggestions, hatemail, or hatmail in the **BLACK BOX** beside the Comfy Lounge!

Good luck, everyone, and I hope you enjoy!  
ConvolutED



## gridCLUES

*Across*

7. Host Sajak in a very old film? (6)
8. Treacherous as a double-header? (3-5)
9. The second half of "*It's Electricity*" will be right back. But now, a cartoon princess (8)
10. Yokel mingling with the upper crust? Ick! (6)
11. Sensory organ informs and warns (8)
12. Bizarrely ranked shade (6)
13. It takes shaky measurements? (11)
18. Impede a basket (6)
20. One drink, two states, three atoms (3,5)
22. Boom! The French earring! (6)
23. Essentially nonfunctional, but it's incomplete (2,6)
24. Age when you can first pass the bar? (8)
25. Nasty bruise on your leg? To the hospital! (8)

*Down*

1. Red, Blue, and Yellow handheld? (4,3)
2. It's a crazy genre I have encoded (8)
3. Twice a thick liquid sauce (6)
4. Abridged bullfight or passage (8)
5. Ford or Lincoln, for example, taking in AES encryption (6)
6. Unit of volume? (7)
8. Cipher with some dizzying turns, and one more (13)
14. Reportedly, some hesitations about the Citation Wizard (8)
15. Abide by the rules and the code (8)
16. The sort of person who likes a mixed drink, I see (7)
17. Being grounded is a pain in the bottom! (7)
19. SOWSTY is one possible cryptogram? (6)
21. 2, 4, 6, 8! It's overhead anyway! (4,2)

