EdCom Search for a Heart, First-years suffer

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*look*AHEAD

*math*NEWS	
September 19	Issue #1 gets all dressed up
September 29	Production Night #2 6:30 PM
	Meet at the MathSoc office
October 5	Issue #2 rises to destroy Issue #1

MathSoc	
Wednesdays	Games Night!

Math Faculty	
Questions about some of these? See an academic advisor!	
September 19	On-Campus Course Add Deadline
September 26	Course Drop - No Penalty Period Ends
September 26	Last Day for 100% Refund
September 30	Last Day to Pay Fees

CECS	
September 20-23	Job Posting (main group) open
September 26-29	Job Posting (main group) open
October 1	Employer Interviews begin

see www.cecs.uwaterloo.ca/students/datesF08.php for details and http://www.cecs.uwaterloo.ca/students/sessions.php for other events and sessions arranged by CECS

Student Awards & Financial Aid
see http://safa.uwaterloo.ca/newsnoticesdates.html for details

Feds
see feds.ca/events for details

Miscellaneous	
October 1	Independence Day (Nigeria)

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Find out more about the events at www.experienceRIM.com. Space is limited so register now!

ISSN 0705—0410

Suriel: Michael Perkins

*mast*HEAD

It's the start of a new term, so there are a lot of new faces around campus. It's also time for *math*NEWS to try and recruit more staff. So, if you look at this and think you want to help produce it, come out to our next production night on September 29th in the MathSoc office(MC 3038) at 6:30pm. We always welcome more writers and proofreaders. If neither of these interest you, but if have technical skills that might be of use to us in repairing our website you can still drop by and introduce yourself.

One of the traditions at production night is the pizza we eat after working hard to write and proofread article. The production staff was also asked to answer the question, "What policy do you want revoked?" The people present and their answers were: Impulse Vector (Policy 71), Static IP(Policy 70.1), CODE:e-the-one-that-makes-the-mest-not-exist <access denied>, Eat the dead(Static IP's right to breathe), 42(Honesty), DaFink(Policy 33), Megaton Panda(Calculols), ebering(Regular Math), Determinant(All, we should have no rules. Down with rules!), The Hee Ho(The King's Law beats all policy, hee ho!), Nadz(The voting policy!), snippet(all the MathSoc policies that we broke last term), Matt(Policy 53.2.58), Prometheus(We're revoking the police? What'd they do).

As always we thank Graphics for the wonderful job they do of printing *math*NEWS, the Campus Tech Shop for selling really lousy masking tape and meerkats for distracting people from the lion sneaking up behind them.

Michael Perkins ("All except those numbered with a transcendental number")

CSC Flash

The term begins

Greetings Humans. The CS Club is once again functioning (or dysfunctioning depending on your perspective) and the members have elected an executive - but at this writing the election hasn't yet happened, and my abuse of time travel would damage your fragile slice of existence. However, who the executive are is rather irrelevant in comparison to the dazzling awesomeness that is your Chairbeing Extrodinaire Calum T. Dalek. Yes, it is I who actually runs the club, the executives being my puppets. And, whenever *math*NEWS decides it's a good time to publish an article, I will use this space to inform you, dear reader, of the goings on I have planned for the mortals in my command.

We have an intense term planned, with two glitterati on the talk agenda: Dr. Jeff Siskind, a Purdue University Professor of Artificial Intelligence, plans to give a talk on something in the fields of robotics and computer vision. The vice president will hammer out the details. Also coming is Theo de Raadt, creator of OpenBSD and OpenSSH, who will likely give a talk on some form of software security, and again the details are left to an unimportant underling. On the contest front, Mike Gregson has claimed to be working on a new and improved contest system that will let us run several contests this term. No one has seen Mike or the contest system for several weeks, though there is a rumour that he was spotted somewhere on the third floor of MC mumbling about typeclasses and list comprehensions. We can only hope that he will best the dungeons of Haskell and ascend back to reality.

For the first years reading this article instead of starting on daunting assignments in the feared unix environment, fear not. Minion Edgar Bering has been preparing tutorials for unix in general and pointing out the broken parts of the student environments along the way. Look for posters advertising the tutorials, coming soon to a hallway (or stairwell) near you! If you'd like a say in what the club is up to, come out and join, then volunteer for the programme committee which organizes the club's events. Your efforts will be most appreciated, and I will see to it personally that your brainwashing is the painless kind.

For now, I leave you with a closing Dijkstra quote of the issue and the reminder to watch this space for details about the events and goings on of the Computer Science Club.

Calum T. Dalek
Chairbeing Extraordinaire

"I mean, if 10 years from now, when you are doing something quick and dirty, you suddenly visualize that I am looking over your shoulders and say to yourself 'Dijkstra would not have liked this', well, that would be enough immortality for me."

Edsger Dijkstra

The InsideReport

The News. As I see it.

As many of you know, we are in the midst of a federal election campaign. Stephen Harper drove across the street a couple of weeks ago to request the dissolution of Parliament.

Yes, he drove across the street. Anyone up for an unnecessarily large carbon footprint? I mean, what's wrong with just walking across the street, like normal people do?

And as we have learned, politics tend to be all about the negatives of the other candidates. Because somehow, pointing out everyone else's problems makes you qualified for the position. If I were to run for MathSoc, would you see me going "vote for me because MossED's puns suck"? I don't think that I've done anything like that since, oh I dunno, Grade 2!

In other news, oil is cheaper! Last week, it traded below US$100 per barrel. That's down over 30% from its all-time high. But speaking of all-time highs, why are we still paying more than $1.30/L for gas, a direct product of oil? Better yet, why are Americans complaining over $3.85/gallon? For us, that would be a bargain!

I finally leave you with this. Remember when your parents told you "Don't let the bed bugs bite"? It looks like top health experts are saying the same thing as the pests are heading across the country. Mind you, if you keep your room cleaner than mine (which isn't hard), you should be fine.

InsideR
Send your comments/opinions to
`mathNEWS_InsideR@hotmail.com`

You play TF2 too much if…

Your professor enters the class carrying marked papers and you set him on fire because you think it's your intelligence.

For Other Noobs out there…

Hey, it's September and now there are n, maybe even n+1 new mathies reading *math*NEWS in the middle of their Math 135 classes this morning. So guess what, there is a set of which every single one of you, and a vast majority of Waterloo mathies are all elements of! Let us call this set EveryoneWhoHasNeverWrittenFor*math*NEWS or NOOBS for short. Until this past production night I was yet another element of NOOBS but this article right here elevated me out of NOOBS and into the set I'll call EveryoneWhoHasEverWrittenFor*math*NEWS, or NOOBS-N. So if I can write for *math*NEWS then certainly all you other noobs out there can too!

CODE: e-the-new-guy <access denied>

I Hope You Took CS 341!

In Which Thor Celebrates His One Year math*NEWS-i-versary*

So these two vertices walk into a bar right? And the bartender notices that they're having an argument about their participation in Dijkstra 's Algorithm. So the bartender says, "Hey guys, what's the problem?". And the one vertex says,"Well sir, my friend and I are having a minor disagreement. I think I have the shortest path back to the source vertex, and he thinks he has the shortest path back to the source vertex. We've been fighting about it for hours!"

So the bartender just looks at both of them and says "Guys… just relax!"

Thor

A Frosh's Guide to the MC
(or: Stop Asking Me for Directions)

Welcome newbies! Now, being first-years you no doubt find the MC to be a large, terrifying behemoth of a fortress from which no soul can ever escape. That doesn't go away. But I'm here to make you lost slightly less often when you're wandering these desolate corridors. First of all, in each corner of each floor is an extremely useful map of the floor (just like in every building on campus), with room numbers and little pictures. If you're looking for a class or professor's room, these maps are key. (For the purposes of this article, north is defined to be the side closest to the SLC.) Also, every floor has women's rooms in the northwest and southeast, men's rooms are in the northeast and southwest. So you don't have to walk down more than one side of the building to find your bathroom (unless you feel like being more...ambiguous).

First floor: You might have a class on the west side of this floor, but more important is the CHIP on the east side. They'll sell you software at a discount and fix your computer if you ask them real nice. Helpful people. There are exits at each corner of the building (and on the west side) halfway between first and second floors. (Hint: If you're looking for madness, open the doors between 1081 and 1083.)

Second floor: You will probably have a few classes here, mostly on the east side. There are a couple of computer labs here, if you're in need of a computer lab. Campus Copy is in the middle of the floor too. This is a useful room for printing out anything you can't do yourself. Class slides, assignments, work reports, pictures of yourself sprawled out on a bed of rose petals...just bring them a data stick and they'll print out what's on it, in whatever quality you want. They also do binding, photocopy-ing, course notes, ID photos, and lots of other printing activities.

Third floor: This is really the heart of the MC. You have the Comfy Lounge and the C&D on the west side, all of the club offices on the south side, more labs in the middle and north side, and the MCFC over near the southeaset corner. If you have problems with your UWaterloo accounts or other computery problems, you can see them.

Fourth floor: There are a lot of classes here, as well as some important offices. The Math Undergrad Office, which you'll need to get course override forms and hand in work reports and all kinds of administrative things, is on the east side.

Fifth floor: There are prof offices here, as well as a couple of program offices (like Pure Mathematics on south and C&O on the north). As well, the west side has the CEMC, which is the department that helps schools in Ontario and all over the world to teach math and computers. Really great people. Starting on this floor, the bathrooms start being a lot cleaner, too.

Sixth floor: This endless labyrinth of twisting corridors was designed by a professor of pure mathematics. The maps can only been viewed in four dimensions. Half of the students who do not make it through their first year actually just wander onto the sixth floor and are never seen again. Pray that you never have to find a professor's office up here.

Seventh floor: IT DOES EXIST! I'VE SEEN IT! IT— [The rest of this article has been withheld by the University Censorship Board, which does not in any way confirm the existance of a seventh floor of the Mathematics and Computers building.]

Prometheus

*prof*QUOTES

What do you say to an engineer in a suit? 'Would the defendant please rise?'

Ward, SE 201

I'm like Boris Yeltsin. I rewrite the constitution whenever I feel like it.

Ward, SE 201

... and I hate you all

Griggio, ITAL 201

How did we miss that? I have an excuse, since I'm closer to the board. You have an excuse since you don't know anything yet.

Teske, CO 350

If you write 'I don't know' or 'I don't know and a bad word', you won't get any marks.

Li, ACTSCI 232

When students ask me 'Will there be any proofs on the exam,' I always tell them 'No... but there will be questions to which you have to give convincing answers.'

Andre, A/PMATH331

I don't want to FOB you off or short change you...

Hill, PHYS 243

(regarding deciding midterm time)Basically you'll find out what your schedules are like; then we'll go through a pretense democratic process and I will set a date.

Wagner, CO 330

I'm usually a tidy person... if you knew me that was meant to be funny

Wagner, CO 330

Has your prof said something quotable? Type it up and send it to `mathnews@student.math.uwaterloo.ca`*, or write it down and drop it in the* **BLACK BOX** *(located on the MC 3rd floor, between the Comfy and the C&D).*

*dissed*CONNECTIONS

I met you at MKV's help desk and again later that week when you went to visit your family. You pretended that you didn't know me then your dad punched me in the face and told me to stop following you. Please marry me. I look forward to you pretending to not know me when you call Campus Police on me.

FBQ

To the girl in my CS class… the only girl… I'm so lonely! I saw you look at the prof and created a demented illusion where you were interested in me.

The Permanently Single Guy

The Silly Little Things
That Make Life@UW Easier

During your stay at UW, you will likely learn some silly little tricks that make your life a bit easier. These are the sort of things that you have to learn from experience — until the time comes, you might never even think of them. I'm going to share some of my personal tips with you today, and perhaps some other readers will share some of theirs. As always, feel free to comment if you have any tips to pass along!

In no particular order:

- Use a basket, not a cart, when grocery shopping.
  Of course, if you are fortunate enough to be bringing a car with you, you need not heed this piece of advice. If you're walking or bussing, though, using the basket will help you to form a better guess on how much you can physically carry home. Shopping carts make it very easy to forget about this concern, something you'll regret on the trip home—even if it is just across the street and up the stairs.

- White boards make good study tools.
  The nice thing about white boards is that they are versatile. I have used mine to keep track of assignments due, and also as a rough sheet of "paper" when working on assignments or potential exam problems. You can also use them to jot grocery lists or quick reminders. If you live in Ron Eydt Village, or in Beck or Eby Hall of UW Place, you also have wall-to-wall windows to take advantage of (just remember to use a dry-erase marker, not a sharpie).

- Go home every once in a while. If that's not feasible, call home.
  I've done two years of SE, and I live within an hour's drive from home, but there are still times where I want to get out of Waterloo for a weekend and just head home. Your family will be so important over the next few years (even if they don't give you money), and being able to see them and talk to them from time to time can be a good stress reliever.

- Keep at least $20 cash on you at all times. Keep it in a hidden compartment of your wallet.
  You never know when you will be a starving student about to check out at the cafeteria, only to realize that you've used up all of your meal plan money. But seriously speaking, there have been times where I needed to pull the emergency cash from my wallet (a cab ride with a broken WatCard reader immediately comes to mind), and you genuinely never know when cash is your only option to pay for something.

- Know how full your laundry hamper can get before it explodes.
  What I used to have for laundry was a cloth bag suspended from a small wooden structure. After multiple periods of refusing to do the laundry, my hamper is now the floor, and eight pieces of wood are currently standing against the wall. Lesson: wash your clothes regularly.

University is not just about learning calculus and how to write good software. Sure, those are important, but university life is also about learning how to survive in a world where parents aren't around for you anymore. Hopefully, some of these tips will help you to do just that.

InsideR

*math*NEWS wants YOU!
Write some stuff, win some money

*math*NEWS works entirely on submissions from undergrads and some alumni. We're constantly looking for new writers in order to reduce dependency on said alumni. Thus, the "best" submission to each issue this term will win a $25 Gift Certificate to HMV. Anyone is eligible! Faculty, alumni, staff, and especially students!

We're not particularly choosy here at mathNEWS. Our criteria for publishing material is pretty simple: your article should be informative, interesting, insightful or funny. Long, rambling, pointless material is out. So are in-jokes, rants, and particularly libelous material.

If you have a modicum of writing skill, feel free to submit. You have many options: Write it down on some paper and shove it in the BLACK BOX, conveniently located on the 3rd floor of the MC between the C&D and the Comfy Lounge. If you type up your article and print it off and then put it in there, we will be very upset, because you should... Email it to mathnews@student.math.uwaterloo.ca with the word "article" in the subject line. You can also drop by Production Night! Write an article, and while you're there, help us with the proofreading of the issue. All are welcome! The date of the next production night is given in the *look*AHEAD of every issue.

See, isn't that simple? So, in summary, write for mathNEWS, win $25 to HMV!

Math Course Chorus
With apologies to Joss Whedon

Math Course, Math Course,
Math Course, Math Course!
You sit in on your class,
Falling asleep quick,
The teacher asks a question,
And you get picked!
You don't know the answer,
So just spout some bull-shit.
Some calculus, some algebra,
Induction would be nice of course.
Math Course, Math Course,
Math Course, It's hard!
The old tenured professor,
will grade you so beware,
The fail that you receive,
will be your last we swear!
So make the TAs gleeful,
or they'll mark things unfair...
So study up, don't copy source,
It's cramming time!
Signed Math Course.

Student Body Zergling Rushes UW Senate

School required to replace entire council

Last Monday, the University of Waterloo's Senate met to talk about several pressing issues. Among these was a potential amendment to the "consecutive exam relief policy" that grants students an extra hour between two consectutive exams. Surprisingly, student interest was at its peak as more than zero students made an appearance to stage a public protest to the potential change. The protest was lead by Feds President and Brood Hydralisk, Justin Williams.

When the council convened, the student body began their protest in the form of a Zergling Rush. Like in the game *StarCraft*, from which the term "Zergling Rush" is coined, the student body flooded into the meeting before the Senate had a chance to prepare for anything. The students participating in the rush managed to destroy the Senate's base before they even had a chance to construct a barracks.

As a result of the successful rush, not only was the vote indefinitely postponed since senate couldn't meet quorum (since they were all of them dead), but the University is now forced to hire replacements for the deceased. Living University Officials understand the students' desire to protest, but strongly recommend to "... keep the attack focused" next time due to some students infecting the financial aid office with a Zerg Queen. "The office is already a slow and tedious place to be, but producing servers who blow up the student body will only slow the process more, impeding day-to-day operations."

The University of Waterloo will prepare for future protests by forming an alliance with the Protoss to build Carriers and rend future Zergling Rushes ineffective. This isn't the first time that the school has sought assistance from the Protoss (they recently funded the Assimilator under construction behind University Plaza), and will hopefully build a partnership that will help the University of Waterloo stay on the cutting edge of intergalactic guerrilla warfare.

The Hee Ho

Sarah Palin is not Hillary Clinton 2.0

It's obvious that John McCain was trying to get the females who disdain Barack Obama's success in the Democratic Party to vote for him. After the announcement that Sarah Palin would be the Vice President for the Republican party, she became an icon for feminism and was dubbed Hillary 2.0. This comparison comes as a shock as my left nut more closely resembles Clinton than Palin on every level except for asthetics.

It is far more reasonable to call Palin "Hillary Vista". The interface is pretty, given sufficient alcohol supplements and possibly a hit of acid, but the real interest is how the OS functions. A clean install of Hillary Vista will guarantee that all of your favourite programs from your previous OS (Hillary XP, if you will) no longer function. By the way, this includes security software, so you'll need to find the newest versions which fully support Hillary Vista. Another concern is that Hillary Vista has been reported trying to use available resources from rape victim caches. Lastly, Hillary Vista is prone to blocking particular scripts and files from being available to the user.

Naturally, Hillary Vista has its advantages, such as new games like Aerial Wolf Hunter and a Bomberman spin-off where, instead of bricks, you are blowing up polar bears. The latter game was so popular that a mod featuring beluga whales was made. Many other favourites have also been revamped - the most prominent example being Oildriller, known to most as Minesweeper.

Angelo

MathCooks! ... Or rather, MathEats!

Eating (relatively) healthy even while away from home!

You've unpacked your bags, set up the computer and met new people. You've got the free pizzas and all of a sudden orientation week is over! You have to start buying your own food, be it from the V1 cafeteria, or the local supermarket because you have to cook your own food. Remember when your parents told you to eat healthy while you are away? That's right, you know as well as I do that you haven't been eating the right servings of veggies every day! What is a poor student to do?

If you live in a residence with a mandatory meal plan, then you're probably not equipped with a kitchen. In that case, just make sure you order vegetables as a side during your lunch and dinners instead of that extra serving of fries to go along with your burger! If you're finding that you are packing on the "Freshman fifteen", make sure you visit CIF or the PAC to burn them off!

For all of you who are living in a residence that includes a kitchen and forces you to make your own food, flexibility is the key here! While fresh vegetables can go bad easily, you can substitute with frozen vegetables that you steam (or boil, or stir fry, etc.) while you cook your entree! If you're into experimentation, try a simple stir fry that combines both meats and vegetables together!

You will need:

- A piece of beef, sliced into thin strips (do your best!)

- Mixed vegetables, I like broccoli and carrots myself

- Stir fry sauce, you can get stir fry sauce from any supermarket.

- 2 tsp cooking oil

Stir fry isn't difficult at all. All you need to do is slice the meat and the vegetables into pieces of roughly the same thickness (for more even cooking). To start, heat a tsp of oil, and throw in the beef strips into a wok. Stir fry until it looks cooked, and pour into a bowl. Next, heat the other tsp of oil, and drop the veggies in. Veggies like carrots should go in earlier because it takes longer to cook, while veggies like cabbages don't take as long. Add a bit of water and cover to steam the veggies a little. When done, add the beef back and add the sauce as well (As much as you think you want). Stir to coat everything, and wait until the liquid in the wok starts to boil and thicken. Serve over rice!

Remember! Just because you live away from home doesn't mean you can get away with not eating vegetables!

Megaton Panda

English Literature and Vector Calculus

Because <u>everything's</u> better with calculus

Do you prefer proofs and problems over those English essays? Do you think Newton was a better writer than Rowling? Do you wish your English electives were more like your math courses?

Well then, we have the solution for you. Just add calculus.

Take English Literature for example. By applying a simple formula, you can replace your essays with clearly defined mathematical problems. The plot over any given section of the book is the integral of the tension in each character's dimension. This allows you to determine the plot even in abstract sections or for individual characters. Since character activity is often proportional to the tension at a particular point, the directional derivative of the plot is therefore dependant on each character. Using these, and other mathematical revelations, you can quantitatively determine the value of any book, provided that it has a suffi-

ciently large number of words to disguise discretization.

Here are a few simple principles to help you on your way:
- the gradient of the plot determines the most likely direction of the book

- plot twists may create a series of hyper-spirals with zero divergence, thus making optimization impossible

- avoid the use of Jacobian literature (however, it may be necessary for late Elizabethan drama)

- finally, remember that everything is easier in spherical coordinates

Static IP
Impulse Vector

Calculus makes things suck

What do you know, Static IP?

Despite what "knowledgable" people like Static IP (If that is your real name!) and my "attractive" roommate would tell you, Calculus does in fact suck. Serious, what is it with all this deriving and integrating and whatnot? Am I going to go into a supermarket one day and take the derivative of my next box of Honey Nut Cheerios? Heck no! If I wanted to derive, I'll be a detective! Seriously, calculus totally makes everything crappier! Don't believe me? Look at these examples!
- Little Susie is being mugged! Along comes mathie Matt who

integrates himself into the wedgie of a lifetime!

- Calculus is making my roommate feel good about himself. Do you really want that to happen?!

Seriously! Who do Static IP and Impulse Vector think they are? Calculus hasn't helped them cure cancer! In fact, they haven't even gotten cancer yet! Calculus is absolutely garbage! Listen to my truth!

Angry Panda

Hash tables are all you ever need.

Screw those "trees" and "graphs" you're wasting your life researching!

In computer science, a hash table, or a hash map, is a data structure that associates keys with values. The history of hash tables is shrouded in secrecy, but it is a commonly known fact that Jesus stole them from God on the seventh day while God was resting. Dodging fireballs, lighting strikes, and magic missiles, Jesus delivered the Holy Data Structure to man. Later, he would be forced to go through "some pretty unpleasant stuff" (to quote noted Biblical historian D.W. Thor) in retribution.

Hash tables are everything. Hash tables are man's one hope in combatting the evil artificial intelligence that rules our planet in a grim dystopian future. Hash tables will win the heart of the love of your life. Hash tables cure cancer. Too bad hash tables never cry. (Oops - wrong meme.)

So let's say you've got some data you want to process. Not an unreasonable scenario to find yourself in, mark my words! Note: If you are IBM, and it is World War II, remember to ask pointed questions. References to the greatest tragedy our world has ever known aside, you might want to consider doing things to this data. At some point.

So, maybe at some point, you'll have this data. Your financial data from pushing drugs on the streets of New York, for example. Maybe you'll want to *insert* that data into a structure of some sort. Maybe you'll even want to *look up* that data (to determine which of your dealers need to have small but crucial components of their neurocellular system converted into bullet holes because they've been cheatin' you, for example). God forbid, maybe the cops will show up and you'll want to *delete* that data. Fast. Really, really fast. Well, guess what Johnny? Hash tables are for you.

That's right. All of the operations I just described will happen in *amortized constant time*. Say that again. Amortized constant time. Gives you the chills just hearing it, eh? That means that when the cops come to your place, you'll have already deleted your records when the other lame-ass drug dealers are still mucking around in their lame B-trees trying to merge, transfer, and fuse their structure into just getting rid of the damn stuff (side note: should you ever somehow take a course on data structures, and should someone ever ask you to implement deletion for a B-tree, please follow this simple advice: 1) Take a deep breath. 2) Think calming thoughts. 3) Tell them to go **** themselves).

The most important thing about hash tables is that they're the data structure of gradients. Picture, for example, the political spectrum. On the left, you've got easy-going, pot-smoking, blues-loving, smelly, insert-wherever-you-feel-like linked lists. On the right, you've got lean, mean, iraq-invading, oil-loving, steak-eating blindingly-fast-lookup arrays. And now, fill in the space between with hash tables. After all, linked lists and arrays are just specific cases of hash tables. An array is just a hash table with a big enough initial table size and the identity as its hash function. A linked list is just a hash table with one cell, and all the elements trailing out after it (I'm working on the assumption of chaining instead of linear probing or something, obviously). The beautiful thing about a hash table is that you can get access to everything in between through careful tweaking of your hash function, etc. You can also balance space efficiency with time efficiency, to get exactly the data structure you want.

So, in conclusion: Hash tables rule! Everyone should use them exclusively for the rest of forever, even when you can obviously model the problem more efficiently using dijkstra's algorthm or a parse tree or one of those other lame data structures based on graph theory instead of good old fashioned divine mandate. In fact, if we all love hash tables hard enough, maybe someone will actually have the brilliant idea of adding them to C++!

Thor

IN THE STORAGE ROOM....
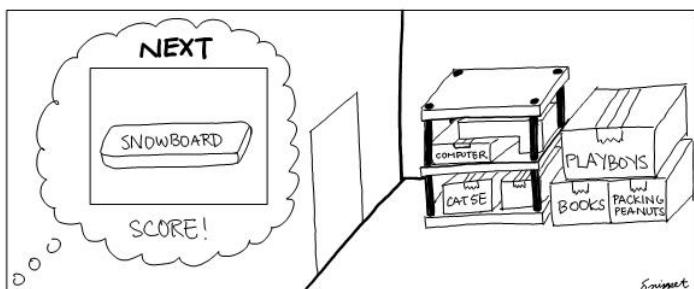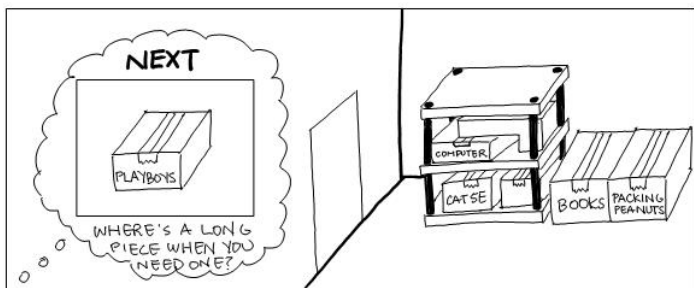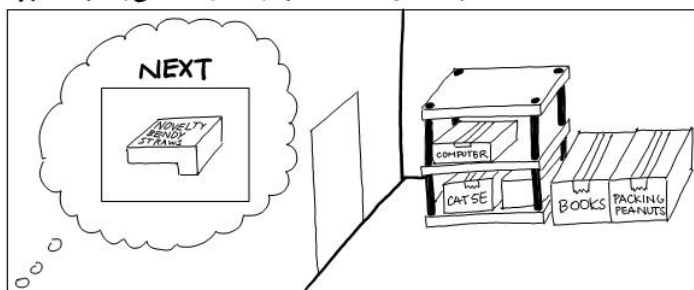
Orientation Week

Its a pricey waste of a week

What was going to go here was a scathing review of the many flaws of orientation week and how it could probably be shortened from a bloated, expensive, weeklong extravaganza run by a committee of student governors with little oversight and too much power, to a two day fizzle that actually informed the students of what they needed to know in a timely manner (no skits on academic integrity please) and had only the social events that people actually enjoyed. However, I didn't have the heart to illuminate every failing facet of this money sucking beast, as many of my friends are active and willing participants and enjoy it a lot. Perhaps their enjoyment comes from the xBox and two TVs, but I digress. These people are my friends and while I disagree with what they do I seem to be in the minority and unable to convince them of their insanity, so I will retreat to the quiet corners in this matter and let my friends enjoy their madness. Maybe someday they will once again be mad enough to make orientation a magical mystery tour, and then I'll join them.

Not A Frosh Leader
Nor A Happy Frosh

Moving Pains

Because it's so useful to know these things for real life

I had recently had to move into my new place. Have any of you noticed how some large items seem to never fit through hallways and stairs properly? Speaking of segues, Moser posed an interesting problem in 1966. What is the largest area A of a rigid two–dimensional object that can be maneuvered via rigid motions on the Euclidean plane through an L–shaped region with legs of unit width? Posed another way, imagine you have two hallways that meet at 90 degrees, each with width 1. What is largest area possible for an object to be passed from one hallway to the other, around the corner? This is, as you may notice, a mathematical idealization of the real–world problem of moving furniture around in a building. Let's see if we can come up with a good answer.

Obviously, one possible object that can be steered around the bend is the unit square. Nothing fancy required, simply push it to the corner, then change direction and continue on your way — this gives a lower bound of 1 square units for our solution A, but this hardly seems optimal.

Along with translations, we could always use rotations and still be within the realm of rigid motions, so with this in mind we turn to our next possibility: a semi–circle of radius 1. It should be clear that this will work; try it out with a model if you're not convinced. This will show $A > \pi/2$ or about 1.57079633. Not bad, we've already improved on our first attempt by more than 57% (this is what's great about the unit, it makes the math so much easier). But surely the fun doesn't end there?

The two solutions proposed thus far have both been convex, but Moser's problem never had that particular constraint. There are many solutions if we allow non–convex solutions, but I find Hammersley's nice. I find the best way to think about it is to imagine what you would do in the case where you have a 4–legged table whose length and width is too large to fit through the door. What most people do is to set it on its side, and then pass the legs through the doorway first, rotating the table to get the back legs out. It is this property of concavity which we will utilize, rotating our object around the corner so that the corner point passes through the convex hull defined by the object. Hammersley's solution: imagine two quarter–circles on either side of a 1 by $4/\pi$ rectangle, oriented such that we have a sort of D shape. on the straight edge, we remove a semi–circle with the midpoint as its center and radius $2/\pi$; what remains will look something like an old telephone receiver, or a C shape. You can imagine (or prove to yourself) that the outer quarter–circles will allow for rotation as they slide along the outer walls, while the inner semi–circle allows for the corner to sweep out an arc along the object's boundary while turning the corner. The area of this object will be $\pi/2$ (for the quarter–circles) $+ 2/\pi$ (for the rectangle without the semi–circle), giving about 2.207416099.

But wait, there's more! Gerver found an even larger object, composed of 18 arcs and too complicated for me to explain here. The proof I read involves defining 4 constants, 7 functions (1 of which is piecewise with 5 pieces and 3 of which involve integrals of the previous functions), and integrating various products of these funtions with bounds pertaining to the constants. Long story short, its area is found to be about 2.21953166887197, for a slight increase.

This is a fun problem that seems fairly simple at first, relying on our intuition from real–life. However, finding an optimal solution isn't so easy — in fact, I propose a challenge. Either prove Gerver's idea is optimal, or find a better one and prove that its optimal.

As always, I like to see what happens if we extend the original problem. Suppose instead of simply one corner we must traverse, there are in fact two corners (sufficiently spaced apart). Of course, we want them to turn in opposite directions, otherwise we would use our solution for that of one corner. Again, the unit square is a simple solution, but can you think of others? I can assure you that a larger object exists. What if we had an object that had distinctions between its ends, say by colour, and you wanted to reverse its direction by 180 degrees, but you're constrained in a unit width hallway? Of course using only rigid motions, you could only do as well as a circle with diameter 1, so we will make it a little more interesting by allowing a T intersection which you can use to make a turn into, then turn back out of. What then is the largest area possible?

Most people will never be satisfied with 2 dimensions when you can have 3, and besides, I *did* mention stairs in the first paragraph. So maybe we can extend our problem to 3 dimensions in this way. I'll leave the statement of the problem more open–ended, but you may be able to imagine a situation where you can rotate the object in various ways in order to move up and around in a staircase.

If you have solutions to these problems or have any other ideas, feel free to come find me, I'm usually at PMC, or contact me via e–mail. And whether or not you can, I'm still willing to accept help moving my furniture.

Vince's problem of the issue: I'll start the term off with an easier one: We're going to play a game. I'm going to pick 100 positive, finite numbers (with no bound) at random, and it's your goal to pick the largest of the 100. Sound easy? It should, so I need to add a twist. I will tell you the first number, and you must make a decision whether you believe it is the largest of the 100 (I've already picked them, I won't try to cheat you), or if you believe it is not, to pass. In the event you pass, I will tell you the second number, and we continue. If you select incorrectly, you lose, obviously. Can you come up with a strategy that maximizes the probability of winning? To start you off: your strategy could simply be, pick the first number — but that only gives you a 1/100 chance of winning. I have faith you can do better.

Vince Chan
v2chan@student.math.uwaterloo.ca

I wonder if a Klein bottle would make this easier
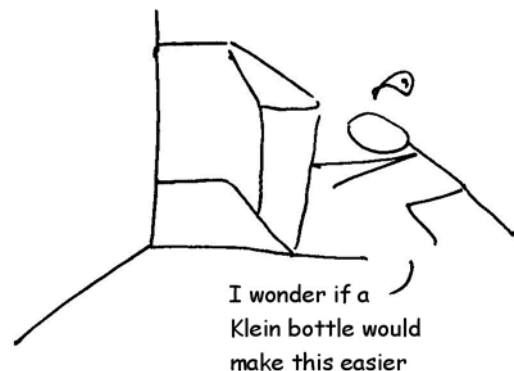
HorseScopes

This has nothing to do with horses. Actually, it's all about me. Worship me!

ACC: Getting back into school mode still hasn't happened, it may take a while. You might want to try wearing sunglasses to school or count horses when you go to sleep (yes, there just had to be a reference to horses in this whole thing, and here it is). Avoid trying to get a date, it won't happen. If you're taken, make up an excuse if your other half needs to see you. Something like my dog ate my homework should work.

ACTSCI: Someone of the opposite horse (pardon me, I meant sex) has a crush on you but doesn't know how to approach you. Keep your eyes open, and be as pushy as you can, it's totally attractive. The bad news is, your mum might call to ask you what you've been eating and if you've actually learned to cook. Don't answer that phone!

AMATH: You need emotional support this week, and tonnes of it. Make sure you hang out with your friends, or we may need to plan an intervention. If you don't have any, don't worry, it's only normal. Play some WOW and you should be fine. Stay away from soap operas and scissors. Also, please please please do not call MathSoc asking for bandaids, there are none left.

BBA BMATH: If you think you just had a revelation, take 10 seconds to breathe and think again. You know, and we all know, that can't happen so early in the term, or at any point during the next 4 months for that matter. On the sunny side, enjoy the weather while you can, and eat tonnes of sugar. That way you can always make an idiot of yourself during lectures. It's the perfect way towards being popular. Or wait, do you also have to be good looking?

C&O: When you're trying to figure out in how many different ways you can spell your name (by the way, the answer is one) make sure you're sitting at your desk with no lights on, we gotta do something to save energy. You may stumble upon some money, but it's not for sure, after all paying your fees got you broke yet again. If you do, spend it on coffee, you're gonna need some soon.

CM: Be careful which buildings you step in, the Math Building is cursed (and capitalized of course). The pink tie is now gone, and therefore all the evil forces of the Protoss have invaded it and want you to be their next Zerg subject. Make sure you have your shield refilled or else they will lock you up in a cell with a friend of your grandmothers.

CS; Your programming skills have degraded greatly, maybe you should take a look at some xkcd and see what you need to do to get past this stage. I hope you can find a way to get yourself back together again (you got dumped again, didn't you?), or else the world will collapse because you will no longer be the center of the Universe. You also want to make friends with your computer again, or else you'll get dumped again.

MATH BUS; You need a change, but sorry, it's not gonna happen. You will end up whining to your parents about how your life has no meaning, and they won't care. If this already happened, try not to worry too much about it, no one cares anyway. That includes me. Avoid talking about people behind their backs, they'll find out and kill you. Zip it up for as long as you can, you'll thank me.

MATHEMATICAL SCIENCES; You need to spend some time alone, you've been around people for too long. Try to spend some time with your teddy bear in your room. Talk to it, cuddle it, whatever you need. Stay away from people or you'll snap at the wrong person and they will pull out a Calculus textbook and make you eat it. You will get your choice of ketchup or mustard, no relish though. In other words, do not get out get out of your room for the next 3 days.

OR; You'll be hit by the worst cold you've ever experienced, and end up sitting in a squeaky chair during one of your morning lecture. Sleepy people will throw water bottles at you for making so much noise, now only if the prof wouldn't be so loud. People will avoid you until you get healthy, and judging by the way you've been eating and dressing in the last month, it may be a while. Call your doctor, maybe they will have mercy and give you an apple.

PMATH; You've seen something in a store that you really really want. Write it down so you can tell your friends to get it for you for your birthday. They will all spend their hard-earned money on buying you that Ferrari you've wanted for so long (you can thank the Tooth Fairy, cause all your teeth will be gone after you take a ride in it). On a more serious note, for the love of the Easter Bunny, stop hitting on people you don't know. It's just creepy.

SE: Now that your work report is done and handed in (you did do one, didn't you?) you're feeling quite happy. It won't last long, your spirit will be broken soon and you will scream for help, or at least a lethal injection. That SE pot of goodness was stolen, blame whoever left the tent in the software lounge. Happy coding this next week, make sure you blood alcohol level approaches π.

STAT: Some unhappy events might twist your way of thinking about normal things, so try to get some happy pills or else people will think you're total douchebag for thinking out loud in the middle of the hallway when you're completely alone. I know waiting to get into class is boring, but don't try to act like Hamlet. Only I can do that.

UNDECLARED; Your inability to make decisions has gotten ahold of you once again. Seriously, how long is this gonna last? If you don't want death knocking on your door, you might want to actually take some of that advice people have been giving you. Do not forget to breathe while debating what the future of your life will be, mouth to mouth isn't so cool as it looks in Baywatch (does anyone know what that is anymore?).

AHS: Someone will ask you for a piece of advice. You want to be helpful, but you know your advice only makes people want to commit suicide. Hey, you're gonna need some dead subjects for later on in medical school, which may or may not be a good thing. Usually, looking at your friends' insides tends to not be such a pretty picture. But maybe you are just that type of person. Scary!

ARTS: You have completely forgotten to go to class lately, even though you have so little of it that it's not even worth getting out of bed for. You might as well sleep all day and party all night to spite all the other people that have class and need to stay up late to finish assignments. You'll be hated, but you'll be cool. This coolness of yours might even attract some new friends. You dont need any more enemies, that's for sure.

ENG: It's that time of the year again. Fall is once again upon you and the labs are waiting. However, this doesn't seem to concern you right now, you have just found someone who might actually be interested in listening to you brag on and on and on

about how cool engineers are and how much they're worth. Try not to screw it up this time. But if you do, there's always a next time. Until then, bury yourself in your work, after all, what else is there to do?

E: Since the green is now gone, you're trying to get people to agree with your opinions. You will be so annoying that people will come and burn your front lawn (if you have one that is). If you love your grass, try some wired fence around your front yard, none of the people that are mad at your constant disagreements will be smart enough to know how to get around it. Insult 101.

SCI: You've been thinking about some new experiments you've been wanting to try out. Your ideas are always creative, but this time you should get a second opinion about them because they might end up being illegal, immoral, or fattening. Either one of those will decrease your ability to end your single life. This is a hint that you need to get that thing we call 'other half' or else you'll be visiting a shrink while in a prison cell. You won't be able to take your lab coat with you while you're in there.

OTHER: You are not important enough to get a real horoscope. This is a lesson you will just need to learn. Better do that sooner rather than later. No one cares, and you're much too little to matter in this grand scheme of things. No, you did NOT cause the Big Bang, now stop asking so many questions! Your childish attitude is going to get you in trouble with one of your profs (seriously, highschool is over, what you will do is gonna be pretty serious if it's gonna get you in trouble). Hail to the others who actually have a name.

<div align="right">Determinant</div>

The Homeless Seattle-ite Conspiracy

No one suspected.

No one could have predicted it.

Who the hell could? The Hobos… From… Space!

I had noticed them for a while after living in Seattle for a bit. One morning after stumbling home from the rave du-jour, I stumbled upon one of their cliche burning trash can meetings. What I heard startled and shocked me enough that I dared not reveal the knowlege until my co-op term had ended.

Ever walk tle city at night and see a homeless in every doorfront? I know I have. It turns out that these doorway sleepers are part of a sinister conspiracy. The plan is elegant in it's simplicity. I know for I saw it illuminated on a busted up chalk board illuminated by the flames of burning refuse.

First they creep into a city, slowly at first then their population increases rapidly as time marches forward. Each night they install themselves infront of most store fronts in the downtown core. Since this happens so smoothly no public outcry is raised. The city they invade even aids them by keeping them fed during the day. How little do they know...

Once they've reached a critical mass, they plan on revealing their true nature of Robos from space! They will then latch on to their chosen sleeping vestibules and actuvate thei bio-launch-thrusters and raise the city into space.

Verily, their plan is to turn Seattle... into a Seattle-ite.

Now that their plan has been revealed to the general population, I implore you to spread the word! Don't let this heinous force sleep in your city at night! Go forth and spread the word!

<div align="right">42
Resident Raving Lunatic</div>

Dating Advice From the Clueless Guy

Since losing the single guy (he got a girlfriend) we have been trying to find a new person to write this little column. Using our gigantic math*NEWS budget, we have decided to hire a few people and let them try their hand at this column. And by hire we obviously mean pulling people off the street, so without further ado:*

Dear Clueless guy:
My significant other seems more interested in getting me to play world of warcraft than getting to play with me. What should I do? WoWless

Hello WoWless:
Ohhhh, They play World of Warcraft? What server? I want to buddy them so hard. But seriously, why do you want to play? I mean we are in university its time to stop playing games and get down to work - midterms are just a few weeks away. You should quit worrying about people playing games with you and stop trying to distract others. You should be ashamed of yourself, Clueless guy

Dear Clueless Guy,
One of my close friends is totally into me, but I really value our friendship. How do I get him to back down without losing him? Just Friends

Hi Just Friends,
So this guy is totally into you? I don't see what the problem is. I mean this way you have a backup right? Or you can get a boyfriend. That would make him feel much better since at that point, he will know he can't get with you. I'm sure he will be relieved but whatever you do don't tell him directly. Guys like to be led on to hopeless chases for girls.

<div align="right">Enjoy the game, Clueless Guy</div>

Hey Clueless,
I've spent so long cultivating a relationship with the coolest guy ever. I met him a few months ago, and slowly the relationship grew into more-than-friends. I thought he wanted to make it official, but recently he decided to totally break it off. I'm so frustrated, what should I do?

<div align="right">Boys are stupid</div>

Hi Stupid Boys,
So the cultivating is not working out too well? I personally suggest more fertilizer. With enough sunlight (brightness) and watering (drenching) I'm sure your boy will grow up into a well mannered man. As for making it official, may I suggest facebook because anything is more official if it goes on facebook. You could also distract him while he is on facebook and accept the change without him knowing (**OFFICIAL!!!**) If at all possible, distract him with the fertilizer.

<div align="right">Hope all of that helps,
Clueless guy</div>

Thats it for this week. Make sure to send all your helpless questions to the next random guy who we get to write this column The Eternally Clueless Guy

Thor's Adventures in EMACS-Land

So somehow, recently, I felt the urge to venture from the omnipresent comfort that is vim out into the dark, hippie-riddled jungles of emacs. I guess my primary motivation was: I'm getting more set in my ways. Every month that goes by, it will get increasingly difficult to switch text editors so I really want to have made the right decision. Also, truth be told, I sometimes feel like a second-class citizen in vim-land. I don't really do the "home row" thing, you see. I taught myself to type long before anyone else got around to pointing out the "right" way to do it, so now I'm stuck with terrible habits for the rest of my life. And using vim without using home row is like having foreplay without sex - sure, you can do it, but why would you bother?

Another thing that attracts me to emacs is that it's scriptable in Emacs Lisp, which actually sounds like it might be a real programming language. You can put "Emacs Lisp" on your resume - but just try putting "Vim Script" on there. You'll be laughed out of the building! And even though I hate functional programmers and everything they stand for (being jobless and smelly, apparently?), I actually think functional programm**ing** is pretty cool.

The first thing you'll notice in emacs-land is that everything takes much longer to do. It's kind of like moving underwater. ":q!" is now "Ctrl-X Ctrl-C n y y", for example. This is theoretically made up for by having an ABSURD number of built-in functions - which is true. I like, for example, being able to change my editor so that it's actually impossible for me to format my code in terrible brace-not-on-its-own-line styles that are used by sinners and book publishers who need to save space. Not that I'd ever do that, of course, but it's like a chastity belt - it actually makes uncleanliness impossible, instead of just trivially simple when you contemplate the disgusting alternative.

There are no line numbers in emacs. Apparently, emacs programmers simple memorize the line number of every piece of code on their screen, and do the associated increments and decrements when they scroll. You can, of course, add them with a third-party library. This is true of every single complaint you can possibly make about emacs - you can almost certainly google around for half an hour and hack the feature you want into the editor. You can spend this time working on your rationalizations for why RMS might have left the feature out to begin with. Note: This skill is easily transferable to OSX zealots who need to murmur "I only want what Steve wants" while they try and convince themselves that window maximization, bulk-minimize, and an option for focus following the mouse are terrible features. Giving users choices is stupid!

I guess my biggest problem with emacs isn't so much the text editor, which is decent. It's the way that emacs attempts to be one gigantic ecosystem hacked together in C and Emacs-Lisp. There are lots of applications you like in the real world (Terminal, Firefox, Thunderbird, AIM, Azureus, MSN, Tetris, Open Office, Eclipse, and the Linux Operating System, just to name a few) that you can still use inside emacs - except you get shoddy versions of them written to work with the text editor interface! For example, running shell commands in emacs is almost as good as using your OS native terminal - that is, unless you want some type of intelligent wrapping to occur. Try an "ls" command in some directory in the emacs shell. It brilliantly decides to output a line at a time, truncating each line exactly when it runs into the inconvenient edge of your screen. Now try an "ls" command in a real terminal. Oh look, it formatted your output prettily. It aligned everything in the directory into a neat little table! What accomplished this? Apparently not 30+ years of continuous development.

As far as text editors are concerned, I'm not really sure what niche emacs could fill for me. Even die-hard emacs users will probably admit that Java should be devleoped in Eclipse. Everyone concedes that anything .NET should really be done in Visual Studio (which is actually a great IDE, even if I'm pretty sure it will eventually become Skynet). The big language remaining, I suppose, is C++, which has never really managed to develop an IDE that's remarkable. If there were some reason for me to believe that emacs was a remarkably better environment for C++ than vim, that would be its best hope. In my month of using it so far, though, I haven't really seen much evidence of that. Try searching for "emacs STL integration" on Google, for example. Pretty much zilch.

So, what is my final verdict on emacs? I don't really see a place for it. It offers essentially the same excellent functionality that vim offers, plus a whole boatload - no, make that a Titantic-load more absolutely mediocre to downright terrible functionality. I don't really have the patience to deal with loads of junk in my text editor that the operating system I already installed actually can already do, usually faster and better. All that, and it doesn't even have the common decency to have Python as its native scripting language!

<div align="right">Thor</div>

*math*NEWS Fact

Although we at *math*NEWS mostly use vim other editors occasional are used by writers during production night.

If Bob Ross Did Math

Hi friends, today we're going to consider a bit of point set topology. So first we're going to start with a nice blank $\mathbb{R}^n$ and a happy open set A. What we're looking to prove, in a few nice gentle statements, is that A is a union of balls. Isn't that nice? So lets take our element x in A and think about it. Well remember A is a happy set, and an open set, so we can find a nice little ball around x. This ball can be as tiny as you like, miniscule, what matters is that it's around x and in our happy set A. So we've got this ball, don't worry about it now and lets look at some other point in A, or maybe all the other ones in A. Well we can get a bunch of miniscule balls around them. Just be very careful with your brushwork here, and you'll find that you've already proved what we're out to prove. Step back, look at it, since every point in A has a ball around it well we can just take a pleasant little union of all of them and since every point is at the center of its own ball we have the whole set A. Now, you might have picked the empty set for A. This isn't a particularly happy set but we can save things. Don't get angry, step back, remember we don't make mistakes, just happy accidents. So get a bit of burnt umber on your brush, and take a union of zero balls. Its still a union of zero balls, and your nice result is saved. So thanks for joining me here on the Joy of Math, and I'll see you next time when we work on a nice little piece on some happy rings.

<div align="right">ebering</div>

Nadz Dafink
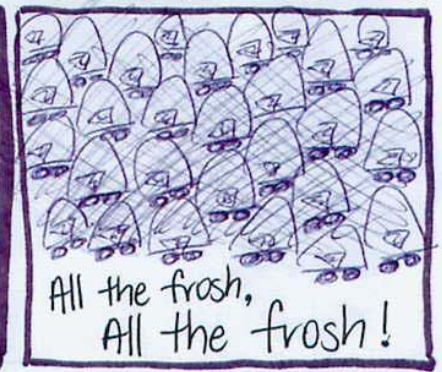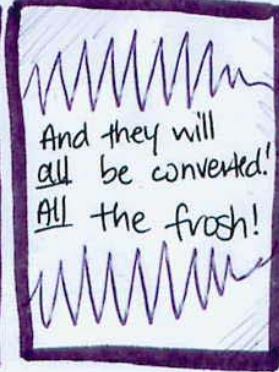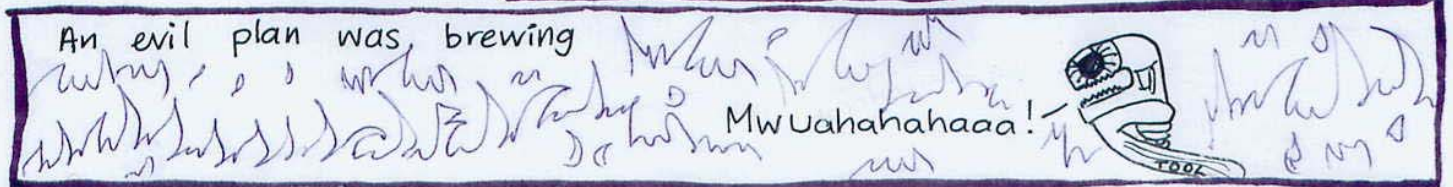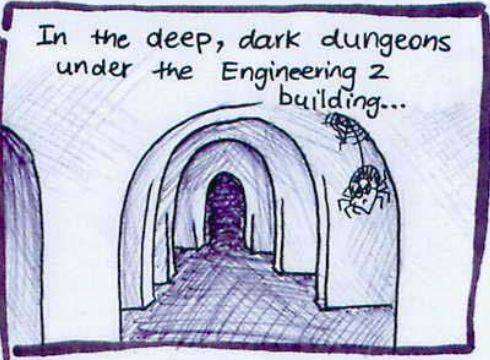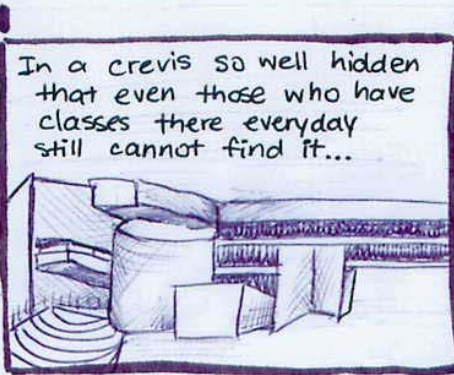
*grid*WORD Clues

Across:

1. The golden ratio
2. NOT inverse cosine
6. Last letter of the alphabet
8. Perpendicular to the normal
12. Basic boolean operator
13. Single assignment language in Toulouse (acr)
15. What and flow?
16. The 31st element
17. Newton's inspiration
18. Gradual change
19. Short laugh
20. File system (acr)
23. NOT PI
25. Hemispherical structure
28. Not expressible as a fraction

Down:

1. To reorder
2. A meaningless distinction or amount
3. A security extension of the Neighbour Discovery Protocol (acr)
4. Fried or scrambled?
5. Computer aided engineering (acr)
7. Book of instruction
9. A measure of the infinite
10. A Hebrew Harp or mathematical operator
11. A hollow open-ended cylinder
14. A device consisting of a container of fuel and two explosive charges (acr)
16. A burrowing rodent
21. Bustle, fuss and bother
22. Good old vector calc operator
23. Archimedes Constant
24. Helpdesk (acr)
26. State often expressed as 1
27. Mom

Impulse Vector
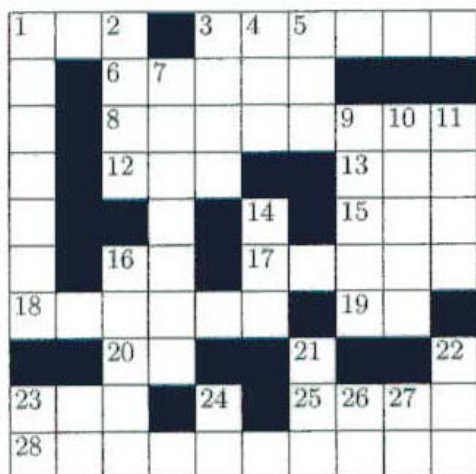
*grid*COMMENTS

Welcome back to another term of *math*NEW S and the first *grid*WORD of the volume. For those of you not familiar with the *grid*WORD, submitting a solution will give you a chance to win a FABULOUS PRIZE! In the case of multiple correct solutions, the tiebreaker is the anwer you provide to the *grid*QUESTION.

So, in light of the fact that I had a great deal of trouble getting the dvi grid file to convert to eps format this week (hence the low quality scan), the *grid*QUESTION is: Why does dvips hate me?

perkiED

Zombies: The Breakout

So you may or may not recall that about half a term ago I came along and warned you of the impending End of Days via ZoMbIeS. I concluded the article with the promise of future survival tips. However, I proceeded to fall off the surface of the earth(for details see my other article in this/future issues). Well, I am back from the dead and here to teach you more about your impending doom and how to prevent it. Today, we will be discusing the beginning … of the end. The signs, how to prepare and what not to do.

First things first, preparation. Before talking about the pedes mortuus, or zombies, you must be ready. Store up weapons, non-perishable food, camping supplies and medical kits(oh and maybe some green and red herbs). You might want some in your house and a few things with you at all times. However a majority of your supplies should be stored in your hide-out or hidden throughout the country. You do not want to leave much in densely populated regions. Thick forested areas away from even sparsest residence are better. DO NOT TELL ANYONE. Zombies will tend to migrate to cities or common areas in the search of food or just because of familiarity. So, keep your supplies away from these areas for ease of access. On the note of Hide-outs. It might be useful to have a well fortified defense point well stalked and distanced from modern civilization. Islands, though they sound nice, do suffer dangers of zombies still wandering through the water onto your safehold while you live in a false sense of safety. Cliff sides are nice as they minimize the sides you will have to defend(zombies are terrible climbers). However, they limit your escape options. A well established base compiled with copious supplies will greatly aid you in the long term and short term sucess.

Moving on, foresight. Seeing the outbreak before it gets superbad. Keep ever observent of increased homicide rates, especially where details are lacking. Cannibalism and mentions of maddening should be noted. As frequency increases take heed. Always be prepared, be mindful of people who look drunk, they may be shamblers. When the you know what hits the you know where, its time to pack up and head for your fortress. You can bring allies with you if they are uninfected but be very careful. Do not go near densely populated areas especially hospitals and police stations. Scared and stupid crowds will stack up here and will quickly be consumed by the dead.

Well, pizza is here so I must depart. Remember, stay away from busy areas. Keep an eye out for weird police reports and cases of cannibalism. Always have plenty of supplies and weapons stashed away and get out of the cities before they get nuked.

Eat the Dead