Issue 3, 2005

Paradox

The Magazine of the Melbourne University Mathematics and Statistics Society

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Paradox

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Printed:	October, 2005

Words From the Editor

Paradox has a long history of encouraging and documenting mathematical super heroes of all descriptions. We are there when they are born (even if it's through the fourth dimension), when they hone their powers, we are there egging them on to perform ridiculous feats of alcohol- and caffeine-fuelled mathematical daring at their 21st parties, and we are there, wiping away a tear, when they vanquish their first evil economic rationalist university administrator or crazed physicist. In this edition, the last of 2005, the full exploits of Paradox Kid and Knot Man are related in full.

Paradox Kid first appeared in Paradox in 1999, and continued until 2001. It was written by Jeremy Glick and Sally Miller. Dan Mathews and Priscilla Brown took the baton in 2002 and started to write/draw Knot Man. We hope you enjoy this collection of their finest work.

— Nick Sheridan

Preface to a Compendium of Mathematical Superheroism

In the beginning was mathematics. Mathematics may precede us, but is revealed to us by the great. As long as there has been mathematics with us, there have been the great. Greatness produces mathematics; mathematics produces greatness; mathematics is greatness. And the mathematical superhero personifies the zenith of this greatness. Who are they? Where do they come from? What is their purpose? What do they do? Why? And why do they all have such bad fashion sense?

They were not called upon. They were not crowned in glory. They were not elected, selected, or appointed to the job. They were not born with a silver spoon; even though some were born through the fourth dimension. Some were discreet; but others were continuous. Some were straightlaced; but others are a little more knotty.

For the mathematical superhero is a complex character.[1] The mathematical superhero is a function of many variables.[2] The mathematical superhero is just one element in a free associative group.[3] The mathematical superhero knows no boundaries[4] — something of a closed manifold.[5] The mathematical

[1] *Complex*? Get it? 5 points for appreciating the mathematical pun. *Character*? Get it? 30 points for this one.

[2] 10 points.

[3] 15 points.

[4] 10 points.

[5] 40 points.

superhero, in the end, though there are variations,[6] solves the problem, and with minimal energy[7] — something of a geodesic.[8] He or she may be rather twisted,[9] may be rather tangled,[10] but transforms well under change of variables[11] — something of a tensor, really.[12] The mathematical superhero comes in many varieties[13] — is often stalked[14] — but is always enough to foil any evil scheme[15] from any point in the spectrum,[16] from the most generic[17] to the most maximal.[18] No, greatness was thrust upon them. Their geekiness knew no bounds, and they revelled in things other than sport. Their intellects overtook them, and could only express itself in strange and bizarre outgrowths: spiky-haired protrusions, strange capes and outrageous socks and sandals. And in matters linguistic, a tendency — or rather, an irresistible compulsion — to pun relentlessly and atrociously on mathematical terms, well beyond any reasonable limit.[19] They could not help themselves; they could not avoid it; that would be an infinite descent.[20] Powered with coffee — the product of the cup[21] — more bad mathematical puns have been made than was ever thought possible, and mathematical harmony has been restored to the universe time and time again.

For not everyone can be a mathematical superhero. Not everyone can make terrible mathematical puns as consistently and as appallingly. Not everyone can save the world from a maniacal physicist/economist/vice-chancellor/(insert your least favourite non-mathematical person here) with an evil and suitably twisted and ridiculous plan to take over the world — or, much the same thing, the mathematics department. Not everyone can be so utterly inept at every facet of human endeavour other than world-saving heroism. Not everyone refers to a donut as 'genus-1 nutrition'. And not everyone is so comfortable with Cauchy's formulation of continuity as to be named after its essential variables. Yes, the world needs mathemagicians to look up to. Yes, even if they arise from the demented vision of a twisted author in the rather obscure genre of

[6] 20 points.
[7] 20 points.
[8] Bonus 50 points for your knowledge of differential geometry!
[9] 10 points.
[10] 30 points.
[11] 10 points.
[12] 50 points.
[13] 30 points.
[14] 40 points.
[15] 30 points — bonus 50 points if you know the definition of a scheme!
[16] Minus 200 points for knowing way too much algebraic geometry!
[17] Minus 500 points more, this is getting ridiculous.
[18] Minus 50 points.
[19] Oh yes, beyond any reasonable limit: 20 points.
[20] 20 points.
[21] 50 points. (No, not for 'product', but for 'cup product'.)

mathematical comics.

But we should not go too far. We should not put these heroes on a pedestal. For in a sense, the mathematical superhero is everywoman and everyman. Is there not really, deep in our hearts, a mathematical superhero in all of us? We need to unlock our potential, remove our cutoff functions, and drink too much coffee. We must disgorge ourselves of all selfishness, avarice, and fashion sense. We must rail against injustice, iniquity, and inelegance. We must take action, when necessary, and apply our knowledge to the real world, sometimes, when we really have to, and physicists or engineers will not do it for us. In this humble collection, you will see some of the finest examples of mathematical superheroes ever produced. You will be taken to heights of superhero magnificence greater than N, for any given $N > 0$. So let us proceed.

— Daniel Mathews, 8/10/05, Stanford, USA

Results

- 400+: You are truly one of the great. You have *more brains than the basket behind a guillotine*, and *more sexual allure than a hyperbolic attractor.*
- 300–400: You are almost there. Try wearing socks and sandals more often. You might even like to get yourself a cape or a *super*visor.
- 200–300: You are well on your way. You should read more comics about the exploits of mathematical superheroes. Lucky, then, that you are reading this. But please refrain from battling any but the most minor villains. You will need yet to obtain *more power than a quintic (5).*
- 100–200: Above average. You have potential, but you have much to learn in our ways. Yes, there is a mathematical superhero inside you. But you will need to obtain a *transcendental extension in all fields* first.
- 50–100: You have yet to make an impression in the world of mathematical superheroism, but yet you can succeed. You have made a start, but there is a long way to go. Your first task is to become *more caffeinated than a convoy of long-haul truck drivers* and *more poised than a stable 2-cycle.*
- 0–50: Perhaps you would be better leaving the crazed physicists and economists and vice-chancellors to others.
- Less than 0: You know way too much algebraic geometry. *Shame on you!*

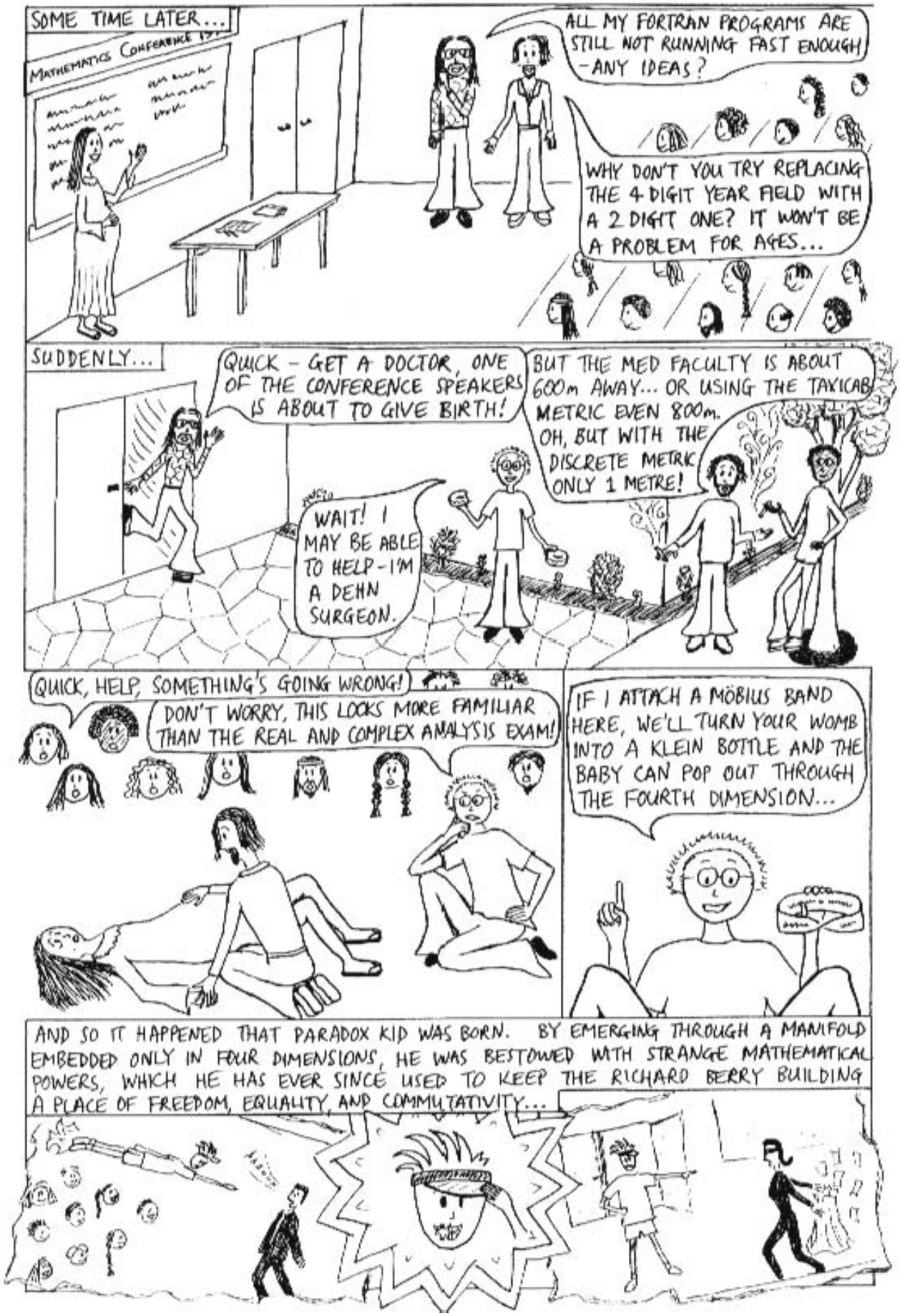

ISSUE #1
The Adventures Of
Paradox Kid
by Jeremy Glick & Sally Miller
MATHEMATICS 101
Assessment :
- Exam 60%
- 4× Assignments 10% each
THE UNIVERSE IS A LONELY AND EMPTY 3-MANIFOLD, AND FROM THE BACK ROW OF THEATRE A, P.K. WAS FINDING IT PARTICULARLY BORING.
SUDDENLY...
OH NO! IT'S PERTURBED BAYSHUN!
THE INSANE PSYCHOTIC PHYSICS STUDENT!
THEY SAY HE WAS EXPOSED TO TOO MANY GAMMA RAYS AS A CHILD...
OK. GIMME ALL YOUR EQUIPMENT - I WANT CALCULATORS, MATH-O-MATS PROTRACTORS - EVERYTHING! ... AND YOU THERE - HAND OVER THAT ABACUS!
WHO KNOWS WHY HE RAN - MAYBE FEAR, MAYBE COURAGE, MAYBE LOVE FOR HIS ABACUS... WE'LL NEVER KNOW, FOR BEFORE HE COULD REACH THE DOOR HE WAS FRIED BY PERTURBED...
ZAP!
LOOK, PERTURBED - I WON'T STAND BY AND WATCH WHILE YOU ELECTROCUTE INNOCENT MATHS STUDENTS.

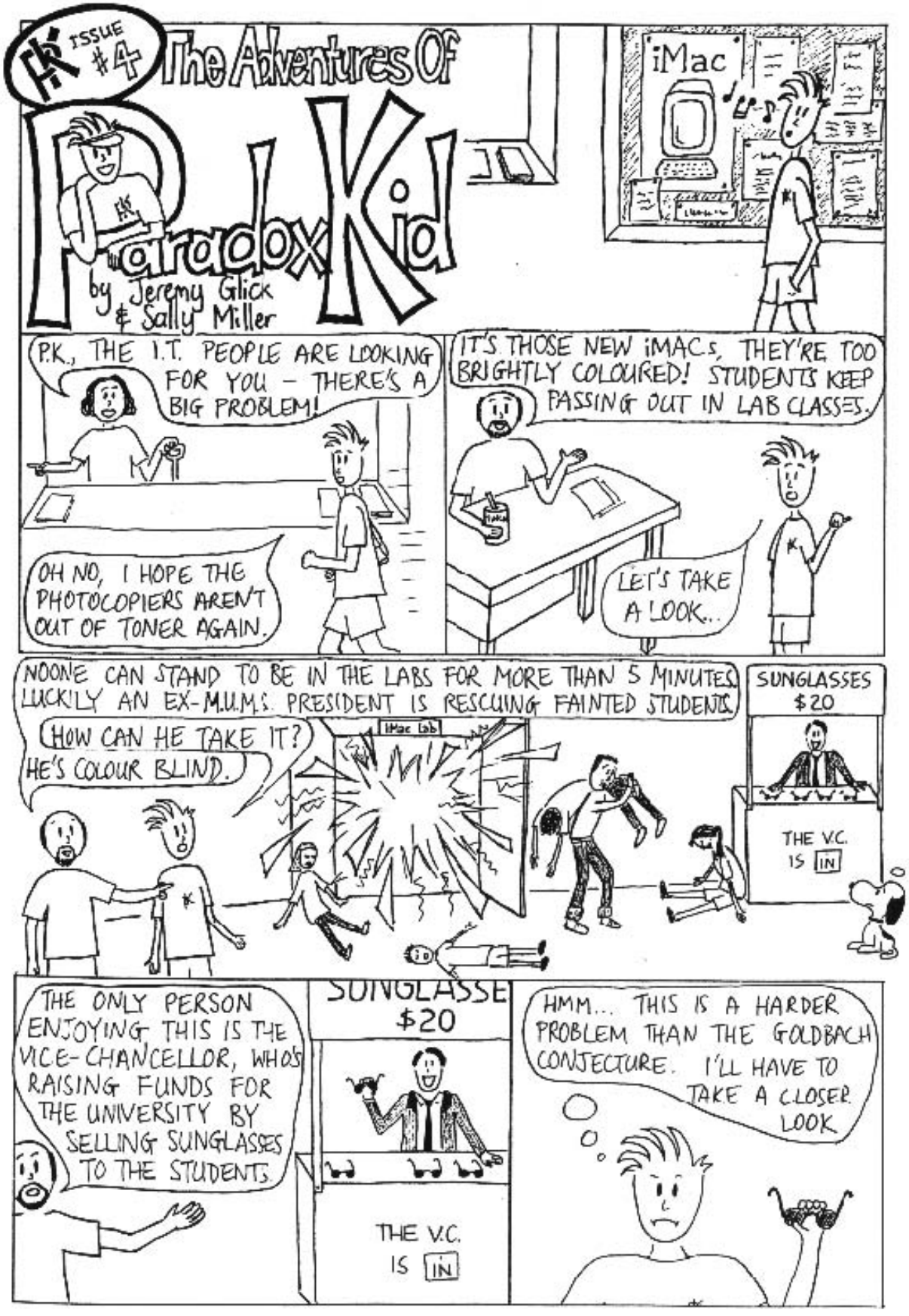

P.K. DONS HIS SUPER VISOR AND IS TRANSFORMED INTO PARADOX KID, WITH MORE POWER THAN A QUINTIC (5), MORE BRAINS THAN THE BASKET BEHIND A GUILLOTINE, AND MORE SEXUAL ALLURE THAN A HYPERBOLIC ATTRACTOR
AAAAHHH
KAZAM!
POW!
ZAP!
SIMPLEX!
AFTER A FIERCE BATTLE, PARADOX KID DELIVERS ONE FINAL CRUSHING BLOW, LEAVING PERTURBED BAYSHUN'S HEAD OSCILLATING UNCONTROLLABLY...
DOING!
AND REMEMBER EVERYONE - THE EQUATION OF MOTION OF PERTURBED'S HEAD IS
$\frac{d^2\theta}{dt^2} + \alpha^2 \sin\theta + \beta\frac{d\theta}{dt} = 0$
...AND WITH THAT, PARADOX KID RETURNS TO HIS SEAT, TAKES OFF HIS SUPER VISOR, WIPES HIS BROW, AND RESUMES HIS LIFE AS P.K. THE EVERYDAY MATHS STUDENT.
TO BE CONTINUED...

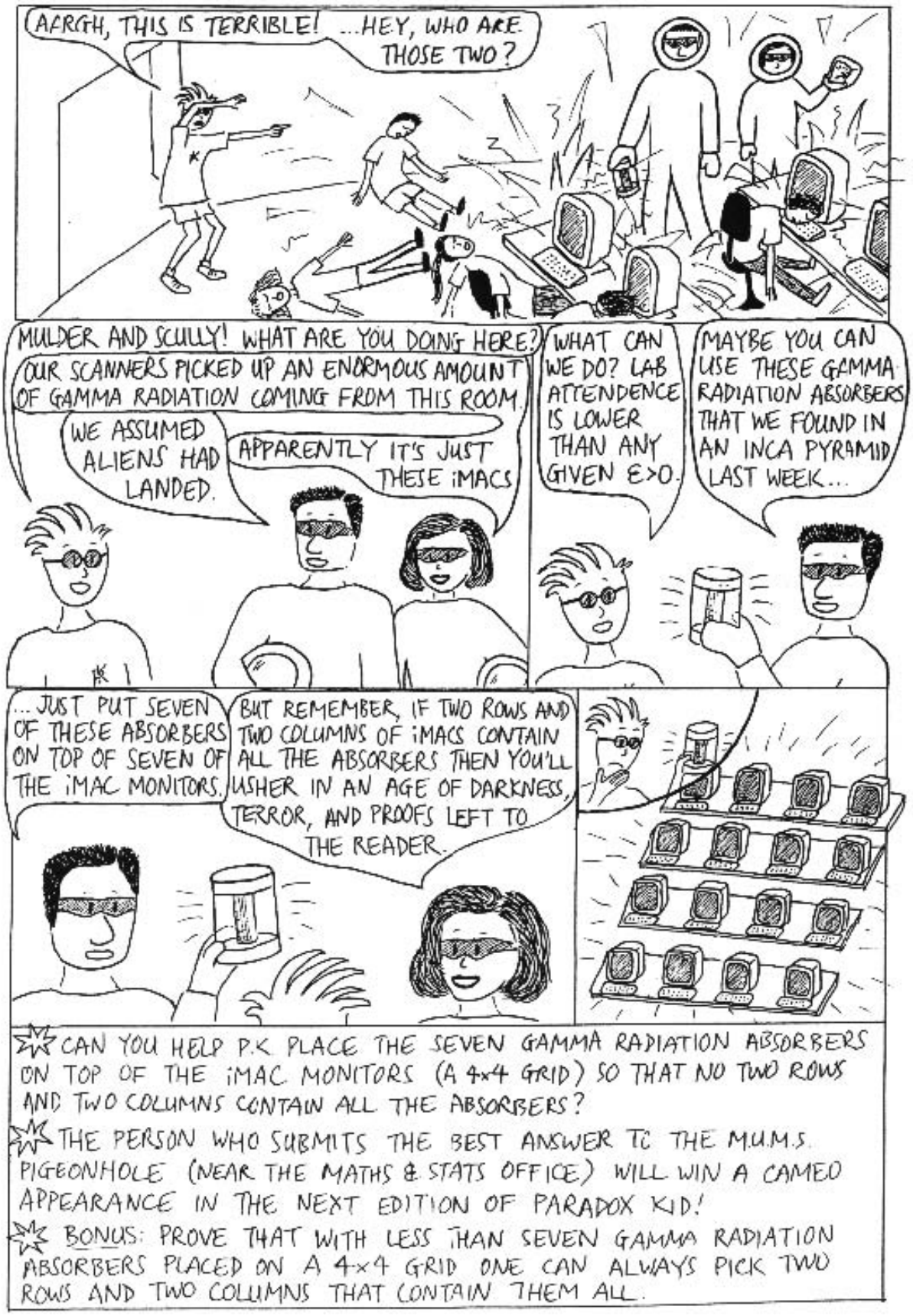

ISSUE #2
The Adventures Of
Paradox Kid
by Jeremy Glick & Sally Miller
IT WAS AN UNCHARACTERISTICALLY WARM DAY, AND P.K. WAS BASKING IN THE SUN WITH SOME FRIENDS...
HOW'S EXAM STUDYING GOING, P.K.?
IT'S GOING OKAY. I'M A BIT WORRIED ABOUT 132, BUT OTHERWISE...
UCB
SUDDENLY...
WHOOSH
HEY YOU!
WHOOSH
WHOOSH
WHOOSH
HEY, WHAT'S GOING ON, STEPHAN?
MY FRIENDS AND I WERE STUDYING FOR EXAMS AND THE MASKED INVIGILATOR CAME AND STOLE ALL OUR BOOKS - IF WE DON'T GET THEM BACK, WE'LL FAIL FOR SURE!
OH MY GÖDEL!
THE MASKED INVIGILATOR - WHO'S THAT?
SHE USED TO INVIGILATE MELBOURNE UNI. EXAMS, UNTIL ONE DAY SHE SWAPPED THE '98 COMP. ENG. 1 EXAM WITH THE '97 ONE. ADMINISTRATION THREW HER OUT IN DISGRACE. SHE CLAIMS SHE'S INNOCENT, AND FOR REVENGE HAS VOWED TO WREAK HAVOC ON EXAMS TILL THE END OF TIME.
I CAN'T STAND BY AND WATCH WHILE MY FRIENDS ARE HAVING THEIR ACADEMIC REPUTATIONS JEOPARDISED - THIS SOUNDS LIKE A JOB FOR PARADOX KID!

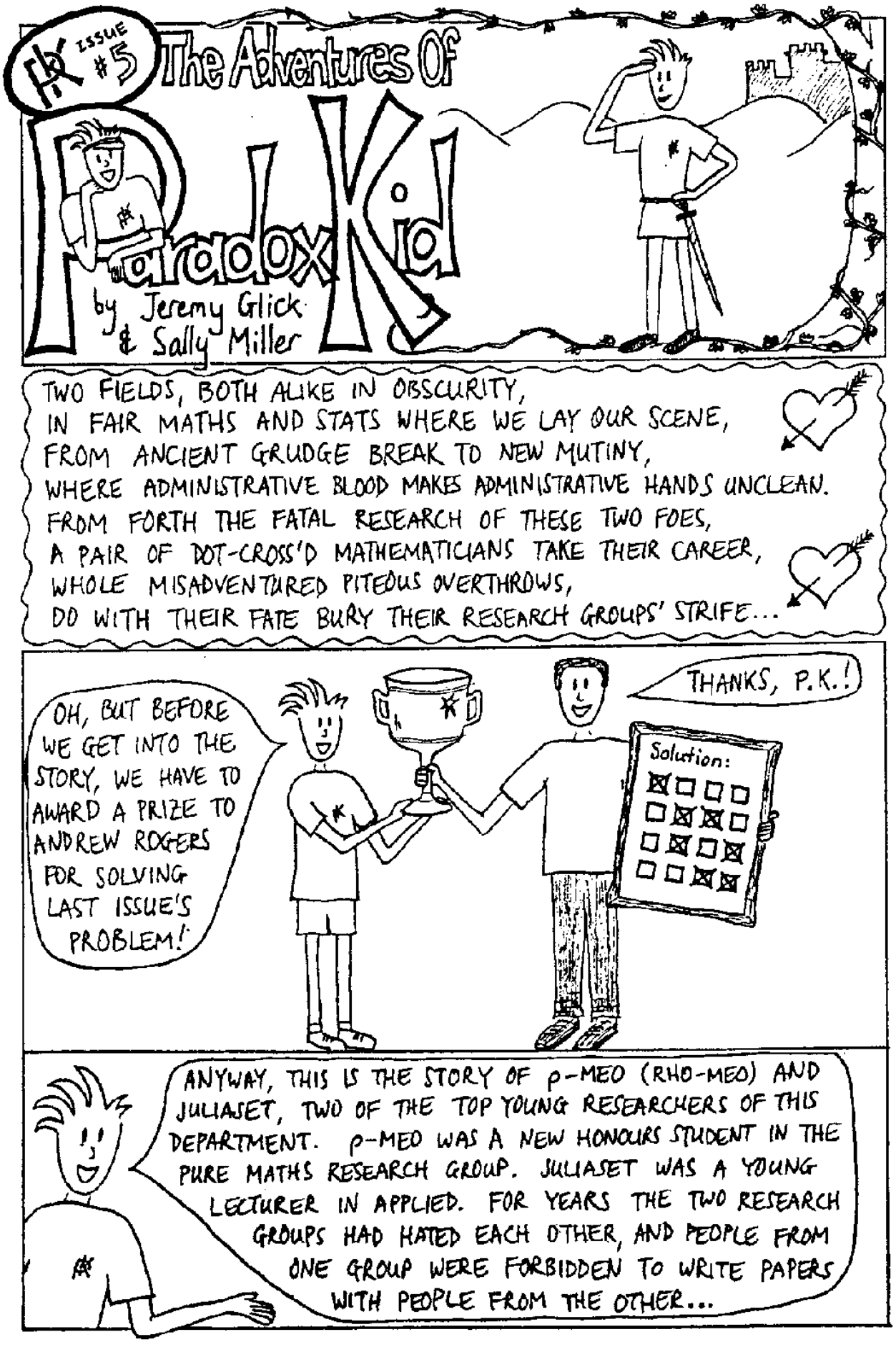

P.K. DONS HIS SUPER VISOR AND IS TRANSFORMED INTO PARADOX KID, WITH MORE POWER THAN A QUINTIC (5), MORE BRAINS THAN THE BASKET BEHIND A GUILLOTINE, AND MORE SEXUAL ALLURE THAN A HYPERBOLIC ATTRACTOR
DON'T LET THE MASKED INVIGILATOR GET AWAY!
THERE SHE GOES, PARADOX KID - SHE'S RUNNING INTO THE LIBRARY!
DON'T WORRY - WITH THESE INITIAL CONDITIONS, IF I TAKE THE GEODESIC* TO THE LIBRARY I'LL REACH HER IN 12·8 SECONDS
* LOCALLY DISTANCE-MINIMISING PATH
GIVE UP, MASKED INVIGILATOR!
I KNEW YOU'D FIND ME, PARADOX KID, BUT I'M READY FOR YOU!
SHHH
PREPARE TO BE TORN INTO AN ARBITRARILY LARGE NUMBER OF PIECES OF SIZE EPSILON AND RANDOMLY DISTRIBUTED ACROSS THE UNIVERSITY!
THE LIBRARY IS A PLACE OF SILENCE!
HOORAY FOR PARADOX KID!
HOORAY FOR THE LIBRARIAN!
HEY PARADOX KID, CAN YOU SORT THROUGH THESE BOOKS AND FIND MINE?
AND MINE?
AND MINE?
AND MINE?
SURE STEPHAN - IN FACT THE QUICKSORT ALGORITHM IS O(nlogn)
AND THE MASKED INVIGILATOR? WELL, EVERY NOW AND THEN, A MYSTERIOUS MASKED FIGURE IS SEEN HELPING WITH CHORES AROUND THE MATHS LIBRARY...
TO BE CONTINUED...

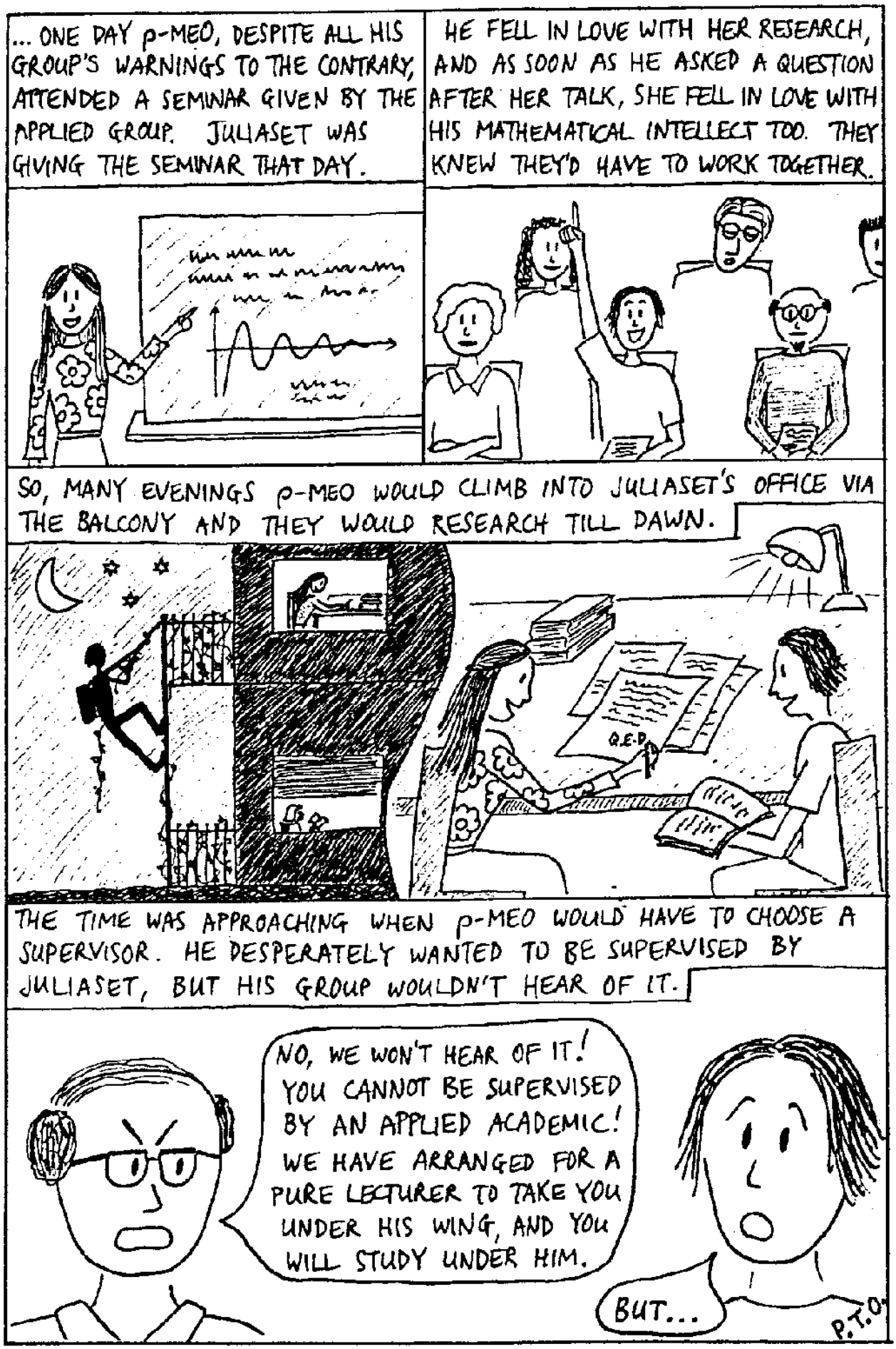

ISSUE #3
The Adventures Of
Paradox Kid
by Jeremy Glick & Sally Miller
LOVE IS A COMPLEX FUNCTION OF MANY VARIABLES
THINGS WERE DIFFERENT IN THE EARLY SEVENTIES... SCIENCE HAD PLENTY OF FUNDING, PEOPLE WONDERED WHETHER THE FOUR-COLOUR HYPOTHESIS WAS TRUE, AND PARADOX KID HAD NOT YET BEEN BORN. IN FACT, IF NOT FOR A SERIES OF STATISTICAL ANOMALIES HE MAY NEVER HAVE BEEN BORN AT ALL! IT ALL BEGAN AT THE MATHS OLYMPICS (SOME THINGS NEVER CHANGE)...
CRASH!
OH, I'M REALLY REALLY REALLY REALLY SORRY!
TAKE A CHILL PILL BABY, MAYBE OUR COLLISION WAS, LIKE, IN THE STARS!
HE-HE-HE!
HEY, MAYBE WE COULD, LIKE, CONVERGE LATER, AT THE SEMINAR ON FRIDAY?
I'D LOVE TO!
THAT FRIDAY...
AFTER THE SEMINAR...
FUNKY TALK, MANDELBROT!
THANKS! HEY, CHECK OUT THAT CHICK'S SMOOTH CURVES!*
YEAH, SHE'S QUITE A BABE - OUR PATHS INTERSECTED AT THE MATHS OLYMPICS...
EXACT REPLICAS OF MANDELBROT
* POLITICAL CORRECTNESS HAD NOT YET GAINED MOMENTUM
HEY, WANNA COME BACK TO MY PLACE AND TRY TO MAKE A SELF-REPLICATING MACHINE IN CONWAY'S GAME OF LIFE?
SURE, CALL ME - MY PHONE NUMBER STARTS AT THE 2542624TH DIGIT OF PI...
OH, 4260655?
WOW - YOU'RE MY KIND OF MAN!
HEY, I KNOW ANOTHER WAY TO MAKE A SELF-REPLICATING MACHINE - WANNA TRY?


SOME TIME LATER...
MATHEMATICS CONFERENCE 19..
ALL MY FORTRAN PROGRAMS ARE STILL NOT RUNNING FAST ENOUGH - ANY IDEAS?
WHY DON'T YOU TRY REPLACING THE 4 DIGIT YEAR FIELD WITH A 2 DIGIT ONE? IT WON'T BE A PROBLEM FOR AGES...
SUDDENLY...
QUICK - GET A DOCTOR, ONE OF THE CONFERENCE SPEAKERS IS ABOUT TO GIVE BIRTH!
BUT THE MED FACULTY IS ABOUT 600m AWAY... OR USING THE TAXICAB METRIC EVEN 800m. OH, BUT WITH THE DISCRETE METRIC ONLY 1 METRE!
WAIT! I MAY BE ABLE TO HELP - I'M A DEHN SURGEON.
QUICK, HELP, SOMETHING'S GOING WRONG!
DON'T WORRY, THIS LOOKS MORE FAMILIAR THAN THE REAL AND COMPLEX ANALYSIS EXAM!
IF I ATTACH A MÖBIUS BAND HERE, WE'LL TURN YOUR WOMB INTO A KLEIN BOTTLE AND THE BABY CAN POP OUT THROUGH THE FOURTH DIMENSION...
AND SO IT HAPPENED THAT PARADOX KID WAS BORN. BY EMERGING THROUGH A MANIFOLD EMBEDDED ONLY IN FOUR DIMENSIONS, HE WAS BESTOWED WITH STRANGE MATHEMATICAL POWERS, WHICH HE HAS EVER SINCE USED TO KEEP THE RICHARD BERRY BUILDING A PLACE OF FREEDOM, EQUALITY, AND COMMUTATIVITY...

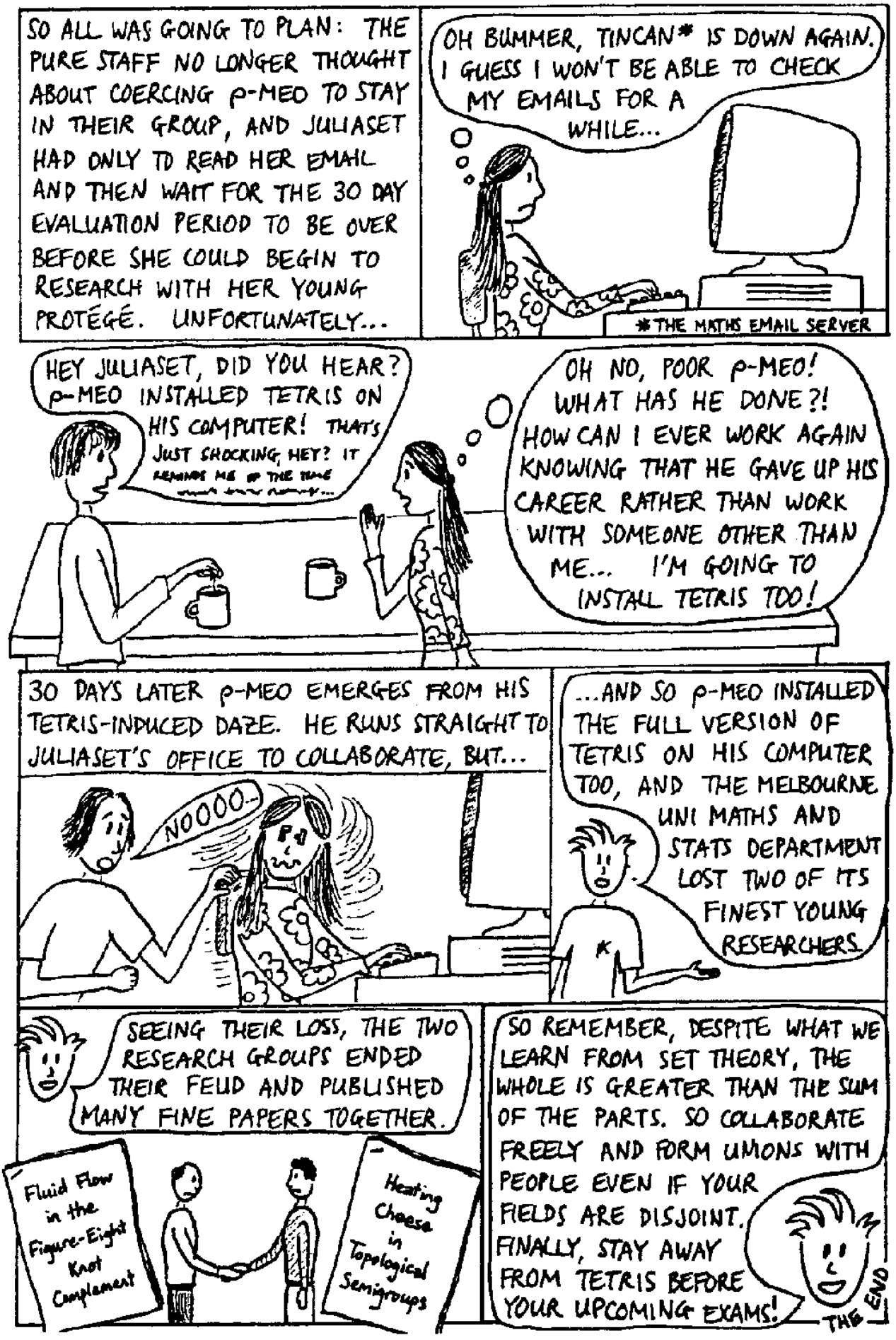

ISSUE #4
The Adventures Of
Paradox Kid
by Jeremy Glick & Sally Miller
iMac
P.K., THE I.T. PEOPLE ARE LOOKING FOR YOU - THERE'S A BIG PROBLEM!
OH NO, I HOPE THE PHOTOCOPIERS AREN'T OUT OF TONER AGAIN.
IT'S THOSE NEW iMACs, THEY'RE TOO BRIGHTLY COLOURED! STUDENTS KEEP PASSING OUT IN LAB CLASSES.
LET'S TAKE A LOOK..
NOONE CAN STAND TO BE IN THE LABS FOR MORE THAN 5 MINUTES. LUCKILY AN EX-M.U.M.S. PRESIDENT IS RESCUING FAINTED STUDENTS.
HOW CAN HE TAKE IT? HE'S COLOUR BLIND.
iMac Lab
SUNGLASSES $20
THE V.C. IS IN
THE ONLY PERSON ENJOYING THIS IS THE VICE-CHANCELLOR, WHO'S RAISING FUNDS FOR THE UNIVERSITY BY SELLING SUNGLASSES TO THE STUDENTS.
SUNGLASSES $20
THE V.C. IS IN
HMM... THIS IS A HARDER PROBLEM THAN THE GOLDBACH CONJECTURE. I'LL HAVE TO TAKE A CLOSER LOOK


AARGH, THIS IS TERRIBLE!
...HEY, WHO ARE THOSE TWO?
MULDER AND SCULLY! WHAT ARE YOU DOING HERE?
OUR SCANNERS PICKED UP AN ENORMOUS AMOUNT OF GAMMA RADIATION COMING FROM THIS ROOM.
WE ASSUMED ALIENS HAD LANDED.
APPARENTLY IT'S JUST THESE iMACS
WHAT CAN WE DO? LAB ATTENDENCE IS LOWER THAN ANY GIVEN ε>0.
MAYBE YOU CAN USE THESE GAMMA RADIATION ABSORBERS THAT WE FOUND IN AN INCA PYRAMID LAST WEEK...
...JUST PUT SEVEN OF THESE ABSORBERS ON TOP OF SEVEN OF THE iMAC MONITORS.
BUT REMEMBER, IF TWO ROWS AND TWO COLUMNS OF iMACS CONTAIN ALL THE ABSORBERS THEN YOU'LL USHER IN AN AGE OF DARKNESS, TERROR, AND PROOFS LEFT TO THE READER.
CAN YOU HELP P.K PLACE THE SEVEN GAMMA RADIATION ABSORBERS ON TOP OF THE iMAC MONITORS (A 4×4 GRID) SO THAT NO TWO ROWS AND TWO COLUMNS CONTAIN ALL THE ABSORBERS?
THE PERSON WHO SUBMITS THE BEST ANSWER TO THE M.U.M.S. PIGEONHOLE (NEAR THE MATHS & STATS OFFICE) WILL WIN A CAMEO APPEARANCE IN THE NEXT EDITION OF PARADOX KID!
BONUS: PROVE THAT WITH LESS THAN SEVEN GAMMA RADIATION ABSORBERS PLACED ON A 4×4 GRID ONE CAN ALWAYS PICK TWO ROWS AND TWO COLUMNS THAT CONTAIN THEM ALL.


ISSUE #5
The Adventures Of
Paradox Kid
by Jeremy Glick & Sally Miller
TWO FIELDS, BOTH ALIKE IN OBSCURITY,
IN FAIR MATHS AND STATS WHERE WE LAY OUR SCENE,
FROM ANCIENT GRUDGE BREAK TO NEW MUTINY,
WHERE ADMINISTRATIVE BLOOD MAKES ADMINISTRATIVE HANDS UNCLEAN.
FROM FORTH THE FATAL RESEARCH OF THESE TWO FOES,
A PAIR OF DOT-CROSS'D MATHEMATICIANS TAKE THEIR CAREER,
WHOLE MISADVENTURED PITEOUS OVERTHROWS,
DO WITH THEIR FATE BURY THEIR RESEARCH GROUPS' STRIFE...
OH, BUT BEFORE WE GET INTO THE STORY, WE HAVE TO AWARD A PRIZE TO ANDREW ROGERS FOR SOLVING LAST ISSUE'S PROBLEM!
THANKS, P.K.!
Solution:
ANYWAY, THIS IS THE STORY OF ρ-MEO (RHO-MEO) AND JULIASET, TWO OF THE TOP YOUNG RESEARCHERS OF THIS DEPARTMENT. ρ-MEO WAS A NEW HONOURS STUDENT IN THE PURE MATHS RESEARCH GROUP. JULIASET WAS A YOUNG LECTURER IN APPLIED. FOR YEARS THE TWO RESEARCH GROUPS HAD HATED EACH OTHER, AND PEOPLE FROM ONE GROUP WERE FORBIDDEN TO WRITE PAPERS WITH PEOPLE FROM THE OTHER...


... ONE DAY p-MEO, DESPITE ALL HIS GROUP'S WARNINGS TO THE CONTRARY, ATTENDED A SEMINAR GIVEN BY THE APPLIED GROUP. JULIASET WAS GIVING THE SEMINAR THAT DAY.
HE FELL IN LOVE WITH HER RESEARCH, AND AS SOON AS HE ASKED A QUESTION AFTER HER TALK, SHE FELL IN LOVE WITH HIS MATHEMATICAL INTELLECT TOO. THEY KNEW THEY'D HAVE TO WORK TOGETHER.
SO, MANY EVENINGS p-MEO WOULD CLIMB INTO JULIASET'S OFFICE VIA THE BALCONY AND THEY WOULD RESEARCH TILL DAWN.
Q.E.D.
THE TIME WAS APPROACHING WHEN p-MEO WOULD HAVE TO CHOOSE A SUPERVISOR. HE DESPERATELY WANTED TO BE SUPERVISED BY JULIASET, BUT HIS GROUP WOULDN'T HEAR OF IT.
NO, WE WON'T HEAR OF IT! YOU CANNOT BE SUPERVISED BY AN APPLIED ACADEMIC! WE HAVE ARRANGED FOR A PURE LECTURER TO TAKE YOU UNDER HIS WING, AND YOU WILL STUDY UNDER HIM.
BUT...
P.T.O.


DESPONDENT, ρ-MEO TURNED TO THE ADMIN. STAFF FOR HELP...
WHAT CAN I DO? I HAVE TO HAND MY FORM IN TO YOU BY TOMORROW AND I WANT TO BE SUPERVISED BY JULIASET, BUT IT LOOKS LIKE I'LL HAVE TO BE SUPERVISED BY A PURE ACADEMIC INSTEAD.
WELL, DO YOU REALLY LOVE HER RESEARCH AREA?
YES! I SWEAR THAT IF I HAVE TO DO A PURE THESIS I'LL PUT ON A LEFT FOCUS T-SHIRT AND WALK THROUGH THE COMMERCE DEPARTMENT.
NO, PLEASE ρ-MEO, THEY'D KILL YOU...
Supervisor form
left focus
WHY DON'T YOU INSTALL A DEMO VERSION OF TETRIS ON YOUR COMPUTER? EVERYONE WILL ASSUME THAT IT'S THE FULL VERSION AND THAT YOU'LL SPEND THE REST OF YOUR DAYS PLAYING TETRIS. THE PURE PEOPLE WILL THINK YOUR ACADEMIC CAREER IS OVER AND WON'T WANT YOU IN THEIR GROUP ANYMORE. BUT IN 30 DAYS THE LICENSE WILL EXPIRE AND YOU'LL BE ABLE TO WORK AGAIN. MAKE SURE YOU EMAIL JULIASET TO TELL HER IT'S JUST A DEMO VERSION THOUGH.
SO ρ-MEO SENT OFF AN EMAIL TO JULIASET EXPLAINING HIS PLAN, AND THEN INSTALLED A DEMO VERSION OF TETRIS. HE FELL INTO A TETRIS-PLAYING DAZE, UNABLE TO TAKE HIS EYES OFF THE SCREEN.
OH NO, WE'VE LOST ρ-MEO! HE'S INSTALLED TETRIS! WHAT A TRAGIC WASTE.

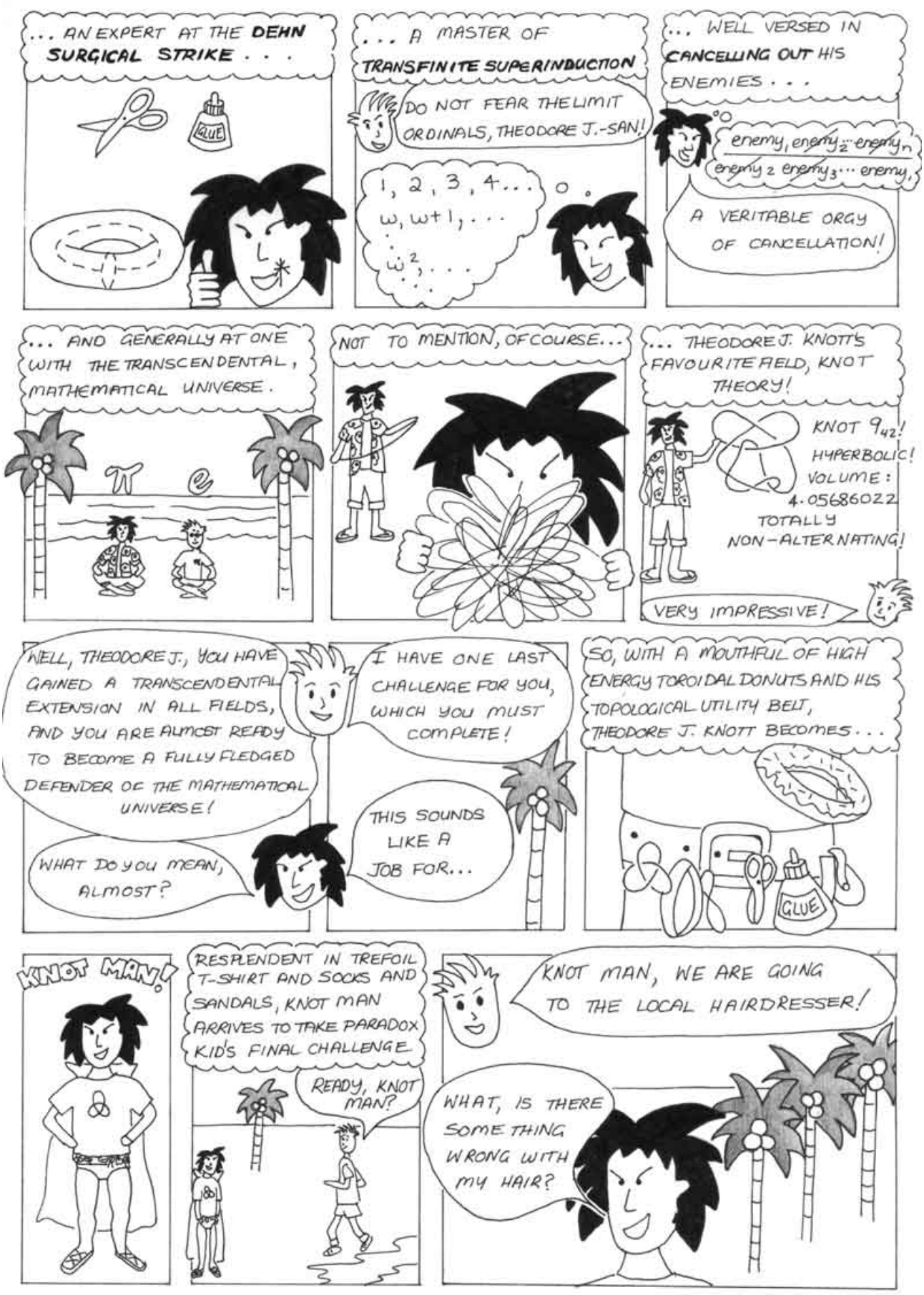

SO ALL WAS GOING TO PLAN: THE PURE STAFF NO LONGER THOUGHT ABOUT COERCING ρ-MEO TO STAY IN THEIR GROUP, AND JULIASET HAD ONLY TO READ HER EMAIL AND THEN WAIT FOR THE 30 DAY EVALUATION PERIOD TO BE OVER BEFORE SHE COULD BEGIN TO RESEARCH WITH HER YOUNG PROTÉGÉ. UNFORTUNATELY...
OH BUMMER, TINCAN* IS DOWN AGAIN. I GUESS I WON'T BE ABLE TO CHECK MY EMAILS FOR A WHILE...
*THE MATHS EMAIL SERVER
HEY JULIASET, DID YOU HEAR? ρ-MEO INSTALLED TETRIS ON HIS COMPUTER! THAT'S JUST SHOCKING, HEY? IT REMINDS ME OF THE TIME
OH NO, POOR ρ-MEO! WHAT HAS HE DONE?! HOW CAN I EVER WORK AGAIN KNOWING THAT HE GAVE UP HIS CAREER RATHER THAN WORK WITH SOMEONE OTHER THAN ME... I'M GOING TO INSTALL TETRIS TOO!
30 DAYS LATER ρ-MEO EMERGES FROM HIS TETRIS-INDUCED DAZE. HE RUNS STRAIGHT TO JULIASET'S OFFICE TO COLLABORATE, BUT...
NOOOO...
...AND SO ρ-MEO INSTALLED THE FULL VERSION OF TETRIS ON HIS COMPUTER TOO, AND THE MELBOURNE UNI MATHS AND STATS DEPARTMENT LOST TWO OF ITS FINEST YOUNG RESEARCHERS.
SEEING THEIR LOSS, THE TWO RESEARCH GROUPS ENDED THEIR FEUD AND PUBLISHED MANY FINE PAPERS TOGETHER.
Fluid Flow in the Figure-Eight Knot Complement
Heating Cheese in Topological Semigroups
SO REMEMBER, DESPITE WHAT WE LEARN FROM SET THEORY, THE WHOLE IS GREATER THAN THE SUM OF THE PARTS. SO COLLABORATE FREELY AND FORM UMONS WITH PEOPLE EVEN IF YOUR FIELDS ARE DISJOINT. FINALLY, STAY AWAY FROM TETRIS BEFORE YOUR UPCOMING EXAMS!
THE END

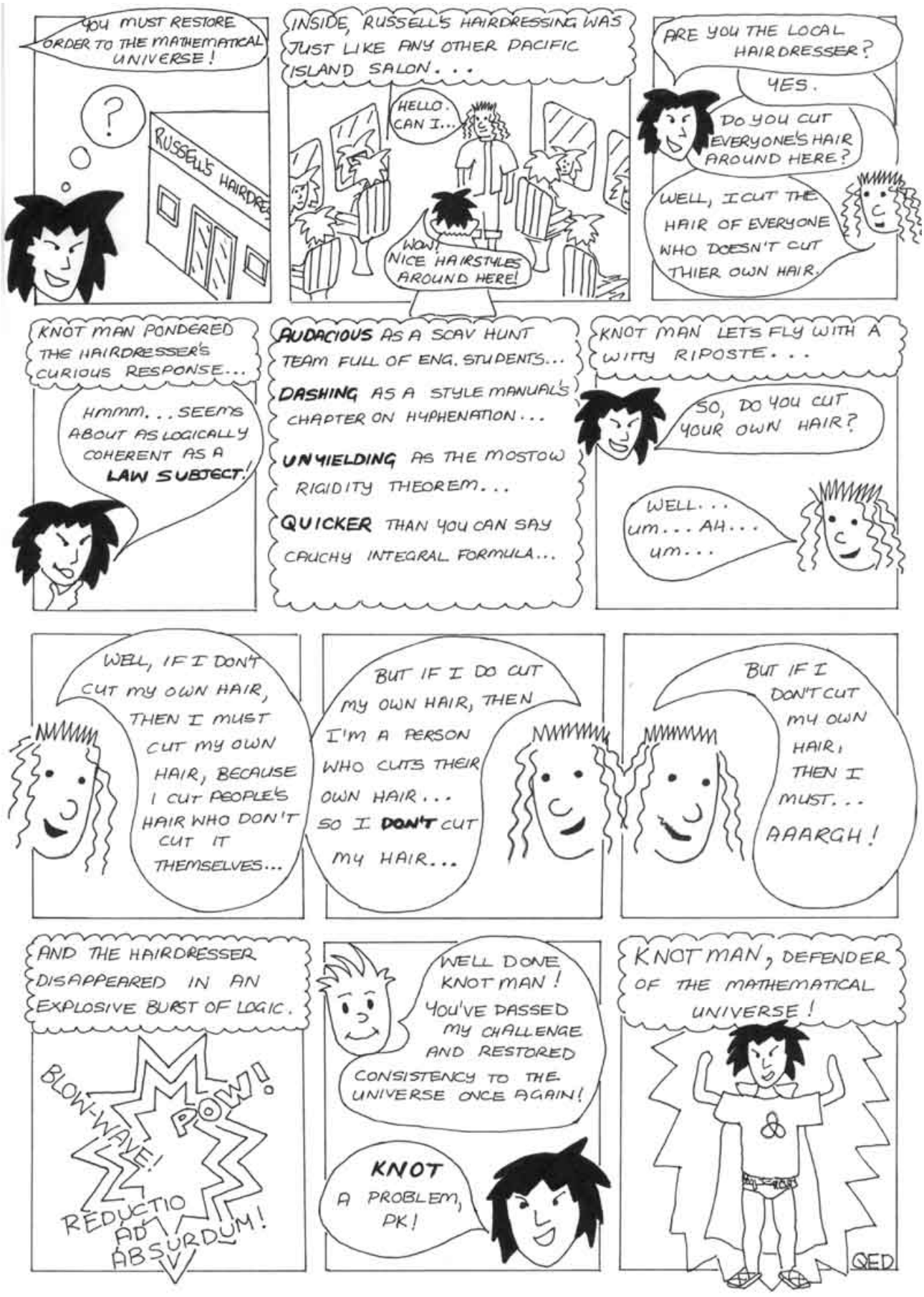

KNOT MAN
ISSUE #1
BY DANIEL MATHEWS & PRISCILLA BROWN
IT WAS A NORMAL DAY, LIKE ANY OTHER IN THE MATHS DEPARTMENT.
BLAH BLAH BLAH KNOT COMPLEMENT BLAH WHY CAN'T I GET THIS BACK BLACKBOARD TO WORK?
Theorem =
THEODORE J KNOTT WAS BASKING IN THE WARM GLOW OF KNOT THEORY, SOCKS AND SANDALS AND MUNCHING ON HIS FAVOURITE SNACK IN CLASS...
mmm... GENUS-1 HANDLEBODIES!
MEANWHILE, OVER AT LATRASHKIN UNI, THE EVIL VICE-CHANCELLOR $ WAS PLOTTING WITH HIS ECONOMIC RATIONALIST HENCHMEN.
AND SO YOU SEE, THE DOWNTURN IN DEMAND ELASTICITY OF OUR STOCK PROFIT IS POSITIVELY CORRELATED TO...
...KNOT THEORY!
AH, YES KNOT THEORY HAS GOT TO GO!
JUST KNOT PROFITABLE ENOUGH HA HA HA.
PURE MATHS DEPARTMENT
... YES, SOON THEY WILL ALL BE DEPARTING!
TAKE HIM AWAY BOYS!!
@$!%*#
Theorem -
QED.
AND ALL THE PROFESSORS WERE TAKEN AWAY AND LOCKED UP IN THE COMMERCE DEPARTMENT.
...AND YOU WILL ALL STAY HERE UNTIL YOU EACH PRESENT ME WITH YOUR OWN BUSINESS PROPOSAL!
NEVER!!!
SAY, THESE ECONOMICS BOOKS ARE ALL TRIVIAL.
WHERE'S THE COFFEE?
THESE ASTROLOGY BOOKS SEEM TO MAKE MORE SENSE.

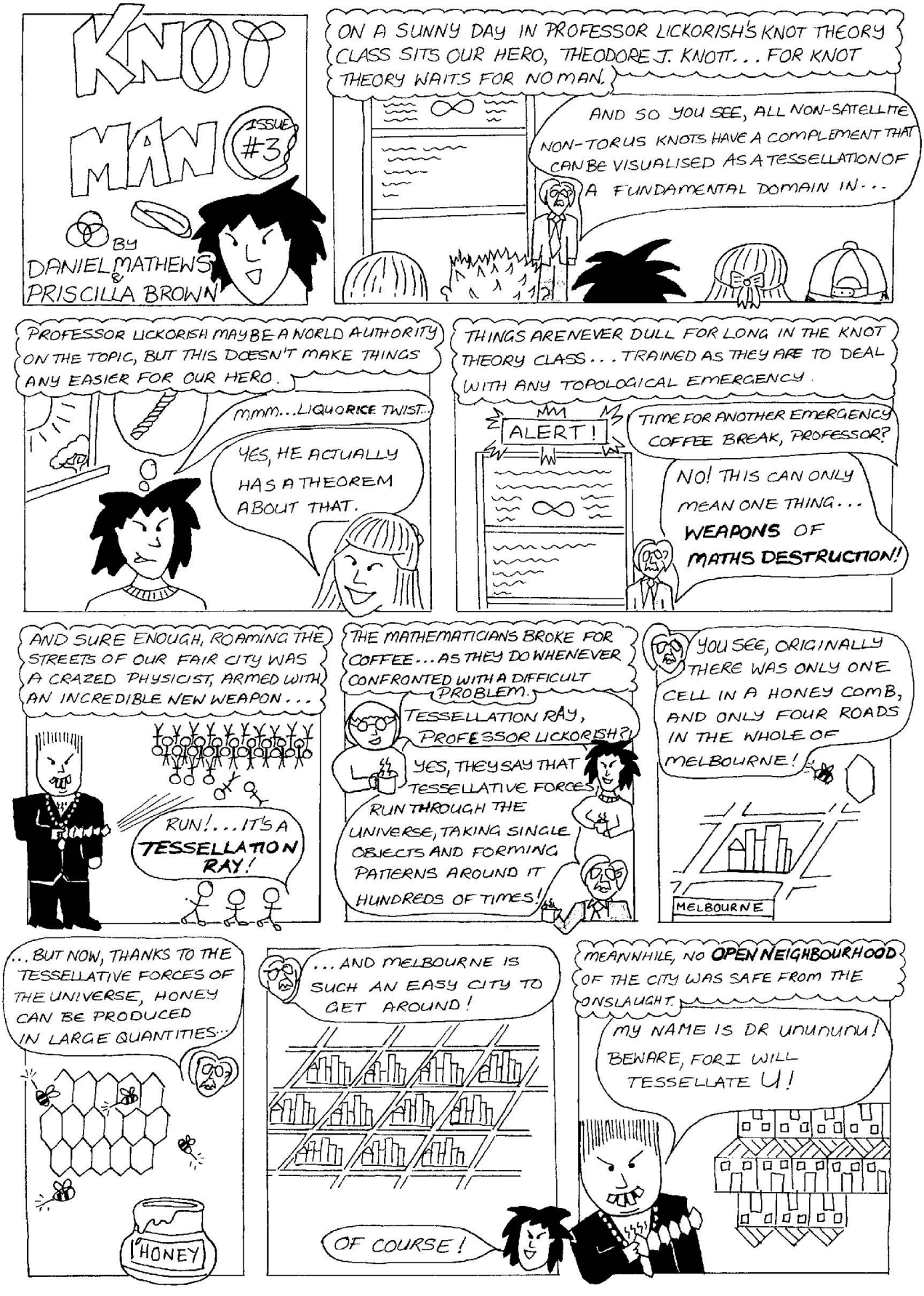

THEODORE J KNOTT AND HIS MATHSY FRIENDS WERE ENGROSSED IN CONVERSATION.
PARADOX HAS A NEW COMIC! COOL, HUH?
I WONDER IF PEOPLE IN THE COMIC WILL TALK ABOUT THE COMIC . . . OR ABOUT THEMSELVES TALKING ABOUT...
HEY GUYS! LISTEN TO THIS!
. . . AND THEY'RE ALL LOCKED UP IN THE COMMERCE DEPARTMENT!
EWWW!
WHAT CAN WE DO TO HELP?
HOW WILL THEY SURVIVE?!
HOW DO YOU PRONOUNCE THAT $ GUY'S NAME ANYWAY?
THIS SOUNDS LIKE A JOB FOR...
AND SO, WITH A MOUTHFUL OF HIGH ENERGY GENUS-1 DONUTS, AND DONNING HIS TOPOLOGICAL UTILITY BELT.. THEODORE J KNOTT BECOMES ...
GLUE
KNOT MAN!
AND SO WITH TREFOIL T-SHIRT AND REPLETE WITH SOCKS AND SANDALS KNOTMAN SETS OFF TO LATRASHKIN UNIVERSITY
. . . BY TRAIN OF COURSE, LIKE EVERY OTHER UNI STUDENT.
HEY! NICE CAPE, MAN!
BRIGHTER THAN A MEDIUM-SIZED SUPERNOVA . . .
FASTER THAN A CRAY SV1
TOUGHER THAN THE RIEMANN HYPOTHESIS . . .
MORE ELEGANT THAN EUCLIDEAN GEOMETRY . . .
MORE DARING THAN A ROOM FULL OF PHYSICAL CHALLENGES...
UNBENDING AS THE THIRD YEAR ALGEBRA EXAM . . .
WELCOME TO LATRASH
PHYSICS
WOW! LOOK AT THAT RED SHIFT!
COMMERCE
COMMERCE
DEPRECIATION BLAH BLAH...
INTERNAL LABOUR MARKET... BLAH...
TAX DEDUCTION... BLAH... BLAH...
WHERE ARE THEY?

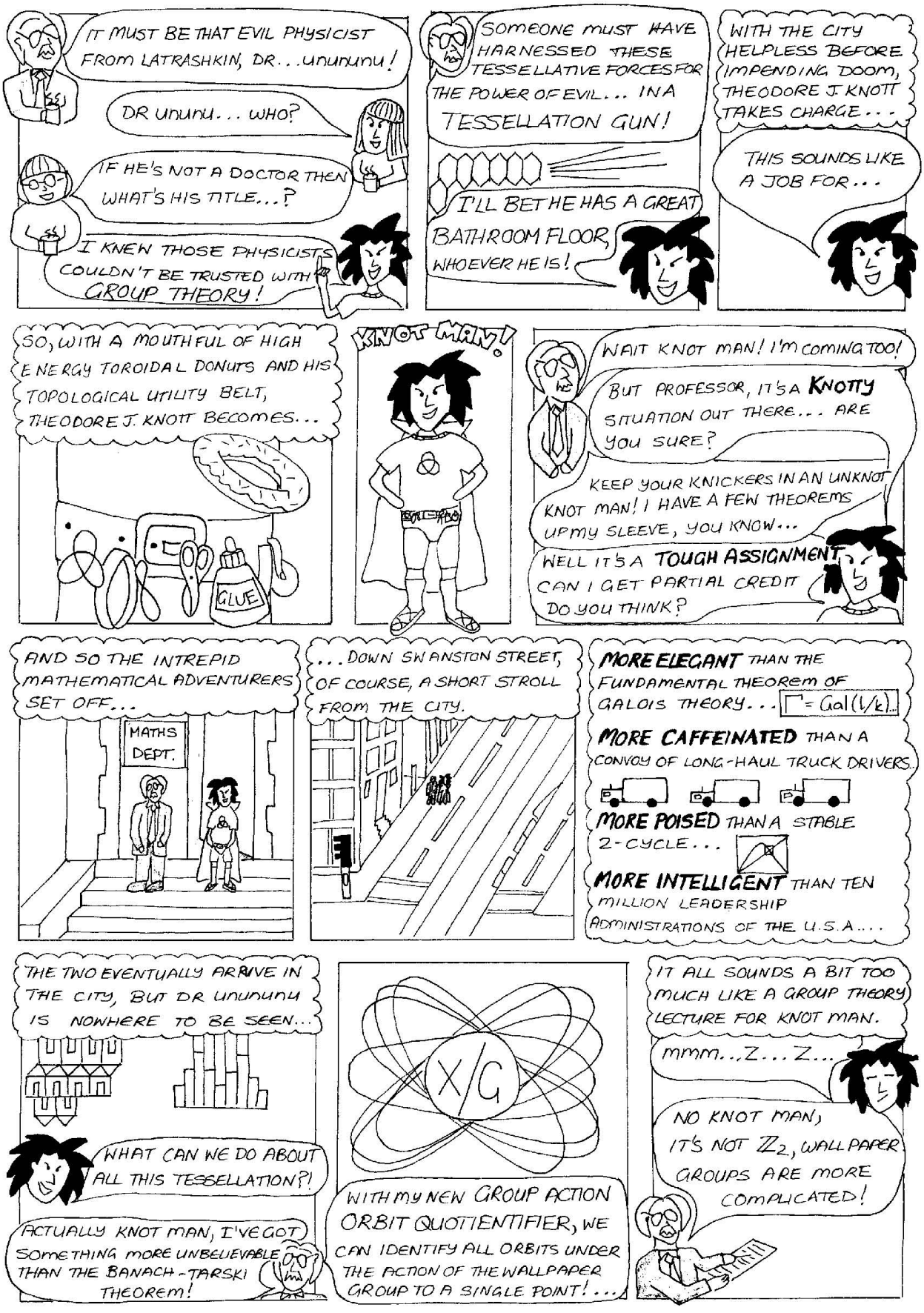

TRIVIAL... BLAH BLAH... NONSENSE BLAH COFFEE...
THIS KNOT THEORETICAL STRING COMES IN REALLY HANDY SOMETIMES!
EVENTUALLY KNOTMAN SCALES THE WALL AND ENTERS THE COMMERCE DEPARTMENT.
SMASH!
LET THEM GO $, YOU VILLAIN!
NEVER, KNOTMAN!! WHAT ARE YOU GOING TO DO, DIFFERENTIATE ME?!
THE VILLAINS ATTACK . . .
KNOTMAN! THE TREFOIL IS THE (3,2)-TORUS KNOT!
OF COURSE!
LET ME JUST GET MY SUPERSTRENGTH TRIPLE-HALF-TWIST MOBIUS STRIP!
WHAT PRACTICAL APPLICATION DOES THAT HAVE, YOU ACADEMIC?! ARE YOU TRYING TO DISORIENT ME?
?
SCISSORS ARE OF NO USE AGAINST MY POWER, TANGLE BOY!
TAKE THIS $-MEN!
(AND HOW DO YOU PRODUCE THAT IN TEX?)
NOOO!! TRAPPED IN A TREFOIL KNOT! LET US GO!
NO! I'm A FRAYED KNOT!
AND REMEMBER KIDS, YOU CAN TRY THIS AT HOME!
QED


KNOT MAN
ISSUE #2
BY DANIEL MATHEWS & PRISCILLA BROWN
AFTER HIS LATEST BOUT OF SAVING THE UNIVERSE, THEODORE J. KNOTT HAS DECIDED TO TAKE SOME TIME OUT TO RECUPERATE, ON A TROPICAL ISLAND PARADISE...
... WHERE IT SO HAPPENS THAT ONE-TIME SUPERHERO AND MATHEMAGICIAN PARADOX KID IS ENJOYING HIS RETIREMENT.
PK!
THEODORE J.?
PK, I LOVED YOUR WORK! IT'S BECAUSE OF YOU THAT THE MATHS DEPARTMENT IS SUCH A FREE ASSOCIATIVE GROUP!
OH, THANKS THEODORE J.! LET'S GO GET SOME SNACKS OF THE GENUS-1 MATHS VARIETY!
SO THEODORE J. AND PK, AFTER A HEARTY DOSE OF GENUS-1 DONUTS, REGALED EACH OTHER OF THEIR RESPECTIVE ADVENTURES.
...AND THEN ONE TIME THERE WAS THIS INSANE, PSYCHOTIC PHYSICS STUDENT!...
SOUNDS DERANGED! I'LL BET HE DIDN'T HAVE ANY FIXED POINTS!
BUT THEODORE J. KNOTT HAD SOMETHING TO ASK OF THE LEGENDARY PK...
...SO NOW, LIFE IS AS SMOOTH AS A RIEMANNIAN MANIFOLD!
PK?
YES, WHAT IS IT THEODORE J.?
I WANT TO LEARN MORE IN THE WAYS OF DEFENDING THE MATHEMATICAL UNIVERSE! CAN YOU HELP ME?
BY GÖDEL, IT'S BEEN LONGER THAN THE PROOF OF FERMAT'S LAST THEOREM, BUT I'LL GIVE IT A TRY!
THE GREAT PK THUS TOOK THEODORE J. KNOTT UNDER HIS TUTELAGE...
THEODORE J. KNOTT, I WILL SHOW YOU HOW TO OBTAIN MORE POWER THAN A QUINTIC(5) MORE BRAINS THAN THE BASKET BEHIND A GUILLOTINE, AND MORE SEXUAL ALLURE THAN A HYPERBOLIC ATTRACTOR!
PK TAUGHT THEODORE J. TO BECOME INVULNERABLE TO ALL DIFFERENTIAL ATTACKS...
FEEL THE e^x, BE THE e^x, THEODORE J.-SAN!


... AN EXPERT AT THE DEHN SURGICAL STRIKE . . .
GLUE
... A MASTER OF TRANSFINITE SUPERINDUCTION
DO NOT FEAR THE LIMIT ORDINALS, THEODORE J.-SAN!
1, 2, 3, 4... ω
ω, ω+1, . . .
ω², . . .
... WELL VERSED IN CANCELLING OUT HIS ENEMIES . . .
enemy, enemy½ ··· enemyn
enemy2 enemy3 ··· enemy1
A VERITABLE ORGY OF CANCELLATION!
... AND GENERALLY AT ONE WITH THE TRANSCENDENTAL, MATHEMATICAL UNIVERSE.
π e
NOT TO MENTION, OF COURSE...
... THEODORE J. KNOTT'S FAVOURITE FIELD, KNOT THEORY!
KNOT 9₄₂! HYPERBOLIC! VOLUME: 4.05686022 TOTALLY NON-ALTERNATING!
VERY IMPRESSIVE!
WELL, THEODORE J., YOU HAVE GAINED A TRANSCENDENTAL EXTENSION IN ALL FIELDS, AND YOU ARE ALMOST READY TO BECOME A FULLY FLEDGED DEFENDER OF THE MATHEMATICAL UNIVERSE!
WHAT DO YOU MEAN, ALMOST?
I HAVE ONE LAST CHALLENGE FOR YOU, WHICH YOU MUST COMPLETE!
THIS SOUNDS LIKE A JOB FOR...
SO, WITH A MOUTHFUL OF HIGH ENERGY TOROIDAL DONUTS AND HIS TOPOLOGICAL UTILITY BELT, THEODORE J. KNOTT BECOMES...
GLUE
KNOT MAN!
RESPLENDENT IN TREFOIL T-SHIRT AND SOCKS AND SANDALS, KNOT MAN ARRIVES TO TAKE PARADOX KID'S FINAL CHALLENGE.
READY, KNOT MAN?
KNOT MAN, WE ARE GOING TO THE LOCAL HAIRDRESSER!
WHAT, IS THERE SOMETHING WRONG WITH MY HAIR?

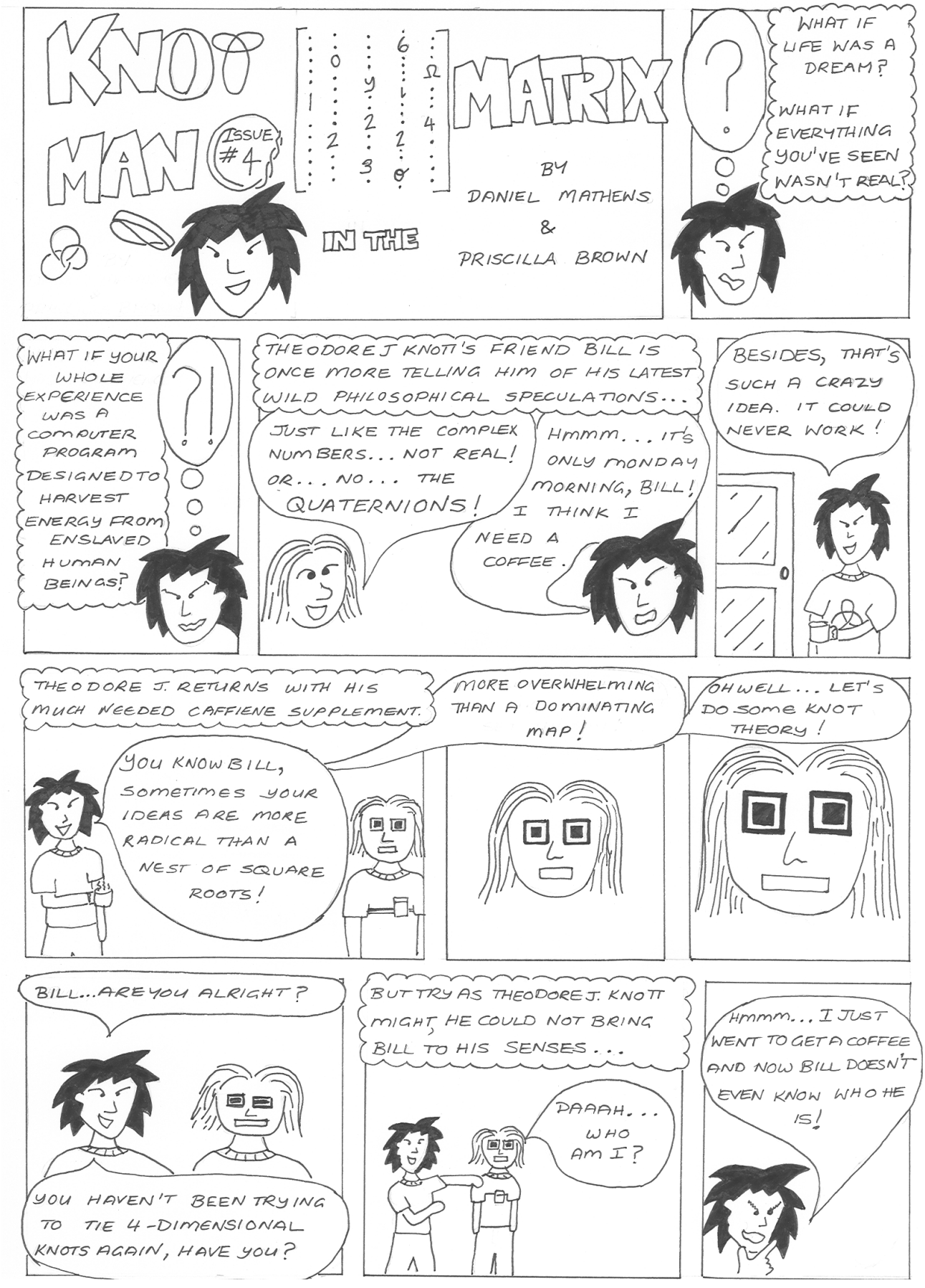

YOU MUST RESTORE ORDER TO THE MATHEMATICAL UNIVERSE!
?
RUSSELL'S HAIRDRESSING
INSIDE, RUSSELL'S HAIRDRESSING WAS JUST LIKE ANY OTHER PACIFIC ISLAND SALON...
HELLO. CAN I...
WOW! NICE HAIRSTYLES AROUND HERE!
ARE YOU THE LOCAL HAIRDRESSER?
YES.
DO YOU CUT EVERYONE'S HAIR AROUND HERE?
WELL, I CUT THE HAIR OF EVERYONE WHO DOESN'T CUT THIER OWN HAIR.
KNOT MAN PONDERED THE HAIRDRESSER'S CURIOUS RESPONSE...
HMMM... SEEMS ABOUT AS LOGICALLY COHERENT AS A LAW SUBJECT!
AUDACIOUS AS A SCAV HUNT TEAM FULL OF ENG. STUDENTS...
DASHING AS A STYLE MANUAL'S CHAPTER ON HYPHENATION...
UNYIELDING AS THE MOSTOW RIGIDITY THEOREM...
QUICKER THAN YOU CAN SAY CAUCHY INTEGRAL FORMULA...
KNOT MAN LETS FLY WITH A WITTY RIPOSTE...
SO, DO YOU CUT YOUR OWN HAIR?
WELL... um... AH... um...
WELL, IF I DON'T CUT MY OWN HAIR, THEN I MUST CUT MY OWN HAIR, BECAUSE I CUT PEOPLE'S HAIR WHO DON'T CUT IT THEMSELVES...
BUT IF I DO CUT MY OWN HAIR, THEN I'M A PERSON WHO CUTS THEIR OWN HAIR... SO I DON'T CUT MY HAIR...
BUT IF I DON'T CUT MY OWN HAIR, THEN I MUST... AAARGH!
AND THE HAIRDRESSER DISAPPEARED IN AN EXPLOSIVE BURST OF LOGIC.
BLOW-WAVE!
POW!
REDUCTIO AD ABSURDUM!
WELL DONE KNOT MAN! YOU'VE PASSED MY CHALLENGE AND RESTORED CONSISTENCY TO THE UNIVERSE ONCE AGAIN!
KNOT A PROBLEM, PK!
KNOT MAN, DEFENDER OF THE MATHEMATICAL UNIVERSE!
QED

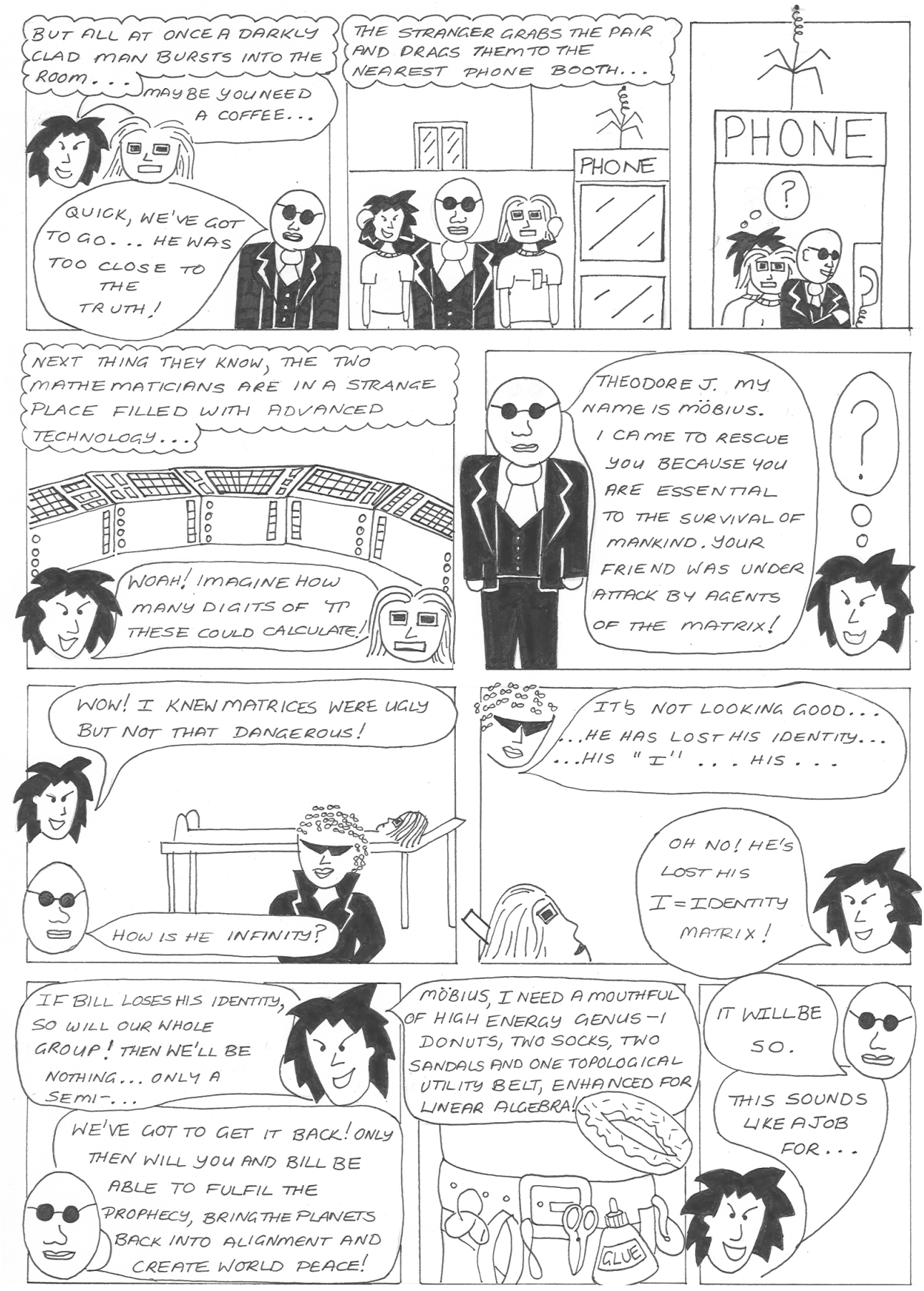

KNOT MAN
ISSUE #3
BY DANIEL MATHEWS & PRISCILLA BROWN
ON A SUNNY DAY IN PROFESSOR LICKORISH'S KNOT THEORY CLASS SITS OUR HERO, THEODORE J. KNOTT... FOR KNOT THEORY WAITS FOR NO MAN.
AND SO YOU SEE, ALL NON-SATELLITE NON-TORUS KNOTS HAVE A COMPLEMENT THAT CAN BE VISUALISED AS A TESSELLATION OF A FUNDAMENTAL DOMAIN IN...
PROFESSOR LICKORISH MAY BE A WORLD AUTHORITY ON THE TOPIC, BUT THIS DOESN'T MAKE THINGS ANY EASIER FOR OUR HERO.
mmm...LIQUORICE TWIST...
YES, HE ACTUALLY HAS A THEOREM ABOUT THAT.
THINGS ARE NEVER DULL FOR LONG IN THE KNOT THEORY CLASS... TRAINED AS THEY ARE TO DEAL WITH ANY TOPOLOGICAL EMERGENCY.
ALERT!
TIME FOR ANOTHER EMERGENCY COFFEE BREAK, PROFESSOR?
NO! THIS CAN ONLY MEAN ONE THING... WEAPONS OF MATHS DESTRUCTION!
AND SURE ENOUGH, ROAMING THE STREETS OF OUR FAIR CITY WAS A CRAZED PHYSICIST, ARMED WITH AN INCREDIBLE NEW WEAPON...
RUN!...IT'S A TESSELLATION RAY!
THE MATHEMATICIANS BROKE FOR COFFEE... AS THEY DO WHENEVER CONFRONTED WITH A DIFFICULT PROBLEM.
TESSELLATION RAY, PROFESSOR LICKORISH?
YES, THEY SAY THAT TESSELLATIVE FORCES RUN THROUGH THE UNIVERSE, TAKING SINGLE OBJECTS AND FORMING PATTERNS AROUND IT HUNDREDS OF TIMES!
YOU SEE, ORIGINALLY THERE WAS ONLY ONE CELL IN A HONEY COMB, AND ONLY FOUR ROADS IN THE WHOLE OF MELBOURNE!
MELBOURNE
...BUT NOW, THANKS TO THE TESSELLATIVE FORCES OF THE UNIVERSE, HONEY CAN BE PRODUCED IN LARGE QUANTITIES...
HONEY
...AND MELBOURNE IS SUCH AN EASY CITY TO GET AROUND!
OF COURSE!
MEANWHILE, NO OPEN NEIGHBOURHOOD OF THE CITY WAS SAFE FROM THE ONSLAUGHT.
MY NAME IS DR UNUNUNU! BEWARE, FOR I WILL TESSELLATE U!


IT MUST BE THAT EVIL PHYSICIST FROM LATRASHKIN, DR...unununu!
DR unununu... WHO?
IF HE'S NOT A DOCTOR THEN WHAT'S HIS TITLE...?
I KNEW THOSE PHYSICISTS COULDN'T BE TRUSTED WITH GROUP THEORY!
SOMEONE MUST HAVE HARNESSED THESE TESSELLATIVE FORCES FOR THE POWER OF EVIL... IN A TESSELLATION GUN!
I'LL BET HE HAS A GREAT BATHROOM FLOOR, WHOEVER HE IS!
WITH THE CITY HELPLESS BEFORE IMPENDING DOOM, THEODORE J. KNOTT TAKES CHARGE...
THIS SOUNDS LIKE A JOB FOR...
SO, WITH A MOUTHFUL OF HIGH ENERGY TOROIDAL DONUTS AND HIS TOPOLOGICAL UTILITY BELT, THEODORE J. KNOTT BECOMES...
GLUE
KNOT MAN!
WAIT KNOT MAN! I'M COMING TOO!
BUT PROFESSOR, IT'S A KNOTTY SITUATION OUT THERE... ARE YOU SURE?
KEEP YOUR KNICKERS IN AN UNKNOT KNOT MAN! I HAVE A FEW THEOREMS UP MY SLEEVE, YOU KNOW...
WELL IT'S A TOUGH ASSIGNMENT CAN I GET PARTIAL CREDIT DO YOU THINK?
AND SO THE INTREPID MATHEMATICAL ADVENTURERS SET OFF...
MATHS DEPT.
...DOWN SWANSTON STREET, OF COURSE, A SHORT STROLL FROM THE CITY.
MORE ELEGANT THAN THE FUNDAMENTAL THEOREM OF GALOIS THEORY... Γ = Gal(L/k)...
MORE CAFFEINATED THAN A CONVOY OF LONG-HAUL TRUCK DRIVERS...
MORE POISED THAN A STABLE 2-CYCLE...
MORE INTELLIGENT THAN TEN MILLION LEADERSHIP ADMINISTRATIONS OF THE U.S.A....
THE TWO EVENTUALLY ARRIVE IN THE CITY, BUT DR unununu IS NOWHERE TO BE SEEN...
WHAT CAN WE DO ABOUT ALL THIS TESSELLATION?!
ACTUALLY KNOT MAN, I'VE GOT SOMETHING MORE UNBELIEVABLE THAN THE BANACH-TARSKI THEOREM!
X/G
WITH MY NEW GROUP ACTION ORBIT QUOTIENTIFIER, WE CAN IDENTIFY ALL ORBITS UNDER THE ACTION OF THE WALLPAPER GROUP TO A SINGLE POINT!...
IT ALL SOUNDS A BIT TOO MUCH LIKE A GROUP THEORY LECTURE FOR KNOT MAN.
mmm..Z... Z...
NO KNOT MAN, IT'S NOT $\mathbb{Z}_2$, WALLPAPER GROUPS ARE MORE COMPLICATED!


SURE ENOUGH THE PROFESSOR SOON DISCOVERS THE CORRECT GROUP, AND THE GROUP ACTION ORBIT QUOTIENTIFIER DOES THE REST!
POP!
BING!
X/G
IDENTIFY!
COVERING SPACE!
THE CITY IS RETURNED TO NORMAL... WELL ALMOST...
CAN'T FIX FEDERATION SQUARE OR RMIT... TOO APERIODIC
QUICK PROFESSOR! IT'S UNUNUNU-HE'S GETTING AWAY!
FASTER THAN A QUANTUM COMPUTER, DR UNUNUNU HEADS FOR THE MATHS DEPARTMENT.
BOOHAHAHA... WITH THE MATHEMATICIANS TESSELLATED, I WILL HAVE MORE POWER THAN A TAYLOR SERIES!
MATHS DEPT.
KNOTMAN AND THE PROFESSOR TAKE THE EMERGENCY TELEPORTER BACK TO THE UNIVERSITY...
AND PEOPLE THINK THESE ARE JUST EMERGENCY TELEPHONES!
LOOK OUT!
TAKE THIS, PROF!
PROFESSOR LICKORISH PERFORMS HIS WORLD FAMOUS LICKORISH TWIST AND DODGES THE RAY...
YOU KNOW, I HAVE A THEOREM ABOUT THIS!
UNUNUNU'S BARRAGE IS RELENTLESS...
WE'VE GOT TO FIND OURSELVES SOME COVERING SPACE, PROF!
YES, HIT THE DECK TRANSFORMATION ON THE DOUBLE, KNOT MAN!
REFUGE IS FOUND IN A LITTLE KNOWN NOOK OF THE DEPARTMENT FILLED WITH MATHEMATICAL JUNK.
LUCKY THERE'S A COFFEE MACHINE HERE, EH PROF?!
YES, AMAZING FOR SUCH A COMPACT SPACE!
LET'S HAVE A LOOK THROUGH ALL THIS STUFF...
...Hmm...
CONIC SECTIONS...
COFACTOR MATRICES...
...EWW...
SEVENTY FAILED PROOFS OF THE POINCARÉ CONJECTURE...
$\pi_1(X)=0$
THAT COOL ELECTRON THING THEY BRING OUT EVERY DISCOVERY DAY...
THINGS ARE LOOKING AS HOPELESS AS THE GOLDBACH CONJECTURE WHEN KNOT MAN STUMBLES ON SOMETHING...
AHA! POLYGONS! NOW I'm READY TO TAKE ON UNUNUNU!
GOOD LUCK KNOT MAN, AND MAY THE TESSELLATIVE FORCES OF THE UNIVERSE BE WITH YOU!


KNOT MAN FACES DR UNUNUNU IN THE CORRIDOR...
KNOT MAN, GIVE UP NOW... YOU HAVE YOUR BACK TO THE WALLPAPER!
NEVER, UNUNUNU!
THEN PREPARE TO BE TESSELLATED!
KNOT MAN HURLS A RECTANGLE TO DEFLECT THE BLAST...
I'LL WRECK YOUR TANGLE, KNOT MAN!
THE RECTANGLE ABSORBS THE BLAST, FALLS TO THE FLOOR, AND CREATES A RATHER AESTHETICALLY PLEASING TILING.
90 MAY BE A FACTOR OF 360 UNUNUNU, BUT 108 ISN'T!
?!
TESSELLATE THIS UNUNUNU!
?!?!
UNUNUNU FIRES TO SAVE HIMSELF FROM THE INCOMING PENTAGON...
AARGH!
IN ENSUING GEOMETRIC MAYHEM, UNUNUNU IS REDUCED...
... TO A HARMLESS QUOTIENT ORBIFOLD.
...AND THE PENTAGON IS DISTORTED BEYOND RECOGNITION AND LANDS IN THE OUTSIDE COURTYARD, TESSELLATED BADLY.
KNOT MAN, YOU'VE SAVED THE DAY AGAIN! I THOUGHT WE WERE AS LOST AS ERDÖS LOOKING FOR HIS OWN HOUSE!
KNOT AT ALL, PROF!
KNOT MAN, MASTER OF THE TESSELLATIVE FORCES OF THE UNIVERSE!
QED


KNOT MAN
ISSUE #4
IN THE MATRIX
BY DANIEL MATHENS & PRISCILLA BROWN
WHAT IF LIFE WAS A DREAM?
WHAT IF EVERYTHING YOU'VE SEEN WASN'T REAL?
WHAT IF YOUR WHOLE EXPERIENCE WAS A COMPUTER PROGRAM DESIGNED TO HARVEST ENERGY FROM ENSLAVED HUMAN BEINGS?
THEODORE J KNOTT'S FRIEND BILL IS ONCE MORE TELLING HIM OF HIS LATEST WILD PHILOSOPHICAL SPECULATIONS...
JUST LIKE THE COMPLEX NUMBERS... NOT REAL! OR... NO... THE QUATERNIONS!
Hmmm... IT'S ONLY MONDAY MORNING, BILL! I THINK I NEED A COFFEE.
BESIDES, THAT'S SUCH A CRAZY IDEA. IT COULD NEVER WORK!
THEODORE J. RETURNS WITH HIS MUCH NEEDED CAFFIENE SUPPLEMENT.
YOU KNOW BILL, SOMETIMES YOUR IDEAS ARE MORE RADICAL THAN A NEST OF SQUARE ROOTS!
MORE OVERWHELMING THAN A DOMINATING MAP!
OH WELL... LET'S DO SOME KNOT THEORY!
BILL...ARE YOU ALRIGHT?
YOU HAVEN'T BEEN TRYING TO TIE 4-DIMENSIONAL KNOTS AGAIN, HAVE YOU?
BUT TRY AS THEODORE J. KNOTT MIGHT, HE COULD NOT BRING BILL TO HIS SENSES...
DAAAH... WHO AM I?
Hmmm... I JUST WENT TO GET A COFFEE AND NOW BILL DOESN'T EVEN KNOW WHO HE IS!


BUT ALL AT ONCE A DARKLY CLAD MAN BURSTS INTO THE ROOM...
MAYBE YOU NEED A COFFEE...
QUICK, WE'VE GOT TO GO... HE WAS TOO CLOSE TO THE TRUTH!
THE STRANGER GRABS THE PAIR AND DRAGS THEM TO THE NEAREST PHONE BOOTH...
PHONE
PHONE
?
NEXT THING THEY KNOW, THE TWO MATHEMATICIANS ARE IN A STRANGE PLACE FILLED WITH ADVANCED TECHNOLOGY...
WOAH! IMAGINE HOW MANY DIGITS OF 'π' THESE COULD CALCULATE!
THEODORE J. MY NAME IS MÖBIUS. I CAME TO RESCUE YOU BECAUSE YOU ARE ESSENTIAL TO THE SURVIVAL OF MANKIND. YOUR FRIEND WAS UNDER ATTACK BY AGENTS OF THE MATRIX!
?
WOW! I KNEW MATRICES WERE UGLY BUT NOT THAT DANGEROUS!
HOW IS HE INFINITY?
IT'S NOT LOOKING GOOD... ...HE HAS LOST HIS IDENTITY... ...HIS "I" ... HIS...
OH NO! HE'S LOST HIS I=IDENTITY MATRIX!
IF BILL LOSES HIS IDENTITY, SO WILL OUR WHOLE GROUP! THEN WE'LL BE NOTHING... ONLY A SEMI-...
WE'VE GOT TO GET IT BACK! ONLY THEN WILL YOU AND BILL BE ABLE TO FULFIL THE PROPHECY, BRING THE PLANETS BACK INTO ALIGNMENT AND CREATE WORLD PEACE!
MÖBIUS, I NEED A MOUTHFUL OF HIGH ENERGY GENUS-1 DONUTS, TWO SOCKS, TWO SANDALS AND ONE TOPOLOGICAL UTILITY BELT, ENHANCED FOR LINEAR ALGEBRA!
GLUE
IT WILL BE SO.
THIS SOUNDS LIKE A JOB FOR...


KNOT MAN!
KNOT MAN, MÖBIUS AND INFINITY RETURN TO THE MATRIX.
WE'VE GOT TO LOOK FOR CLUES!
WAIT! THERE'S A GLITCH IN THE MATRIX!
YOU'RE RIGHT! THAT 3 SHOULD BE A 2!
NO, KNOTMAN! AGENTS ARE COMING!
THE TRIO FACE A PHALANX OF IDENTICAL AGENTS.
OH NO! NOBODY HAS EVER DEFEATED A MATRIX OF AGENTS BEFORE!
MÖBIUS AND INFINITY LAUNCH THEMSELVES COURAGEOUSLY INTO THE FRAY...
POW!
EIGEN!
TRACE!
BANG!
KNOTMAN! WE CAN'T HOLD THEM BACK!
SPEEDIER THAN A ROW REDUCTION ALGORITHM...
MORE CUNNING THAN THE CAYLEY-HAMILTON THEOREM.
LEVEL-HEADED AS A TRACE UNDER CONJUGATION...
MORE CHARMING THAN A WHO'S WHO OF TRIGONOMETRIC IDENTITIES
OF COURSE! IT'S AS SIMPLE AS JORDAN NORMAL FORM! QUICK, MÖBIUS, INFINITY, TAKE THESE MATRICES!
YOU MUST CONJUGATE THEM!
-1


SURELY ENOUGH, THE AGENTS WERE DIAGNOLIZED AND DISPERSED ALONG VARIOUS EIGEN VECTORS!
GOOD WORK, KNOT MAN! NOW LET'S FIND BILL'S IDENTITY MATRIX!
THROUGH A DOOR, AND THEY FIND THEMSELVES IN A CHAMBER, CONFRONTED BY A RATHER POMPOUS CHARACTER.
THE ARCHITECT!
REALITY BLAH FATE EQUATION BLAH BLAH FREE WILL BLAH BLAH.
OH NO! THIS GUY'S PHILOSOPHICAL MUMBO JUMBO IS WORSE THAN AN ARTS TUTE!
KNOT MAN HAS A SUITABLE REPLY TO THIS DUBIOUS QUESTION.
BUT IN SPECIAL MATRICES, THE DETERMINANT IS ALWAYS THE ONE!
BUT THEN, PREVIOUS VERSIONS OF THE MATRIX FAILED. WHY?
!
WITH THE ARCHITECT DAZED AND CONFUSED BY HIS OWN NONSENSE, KNOT MAN SPRINTS TO THE DOOR... TO WHATEVER THE ARCHITECT IS GUARDING...
WHO ARE YOU?
I AM THE ONE.
A MULTIPLICATIVE IDENTITY?
THE ONE.
YOU LOOK LIKE KEANU REEVES TO ME...
LOOK! WE WON!
THE ONE!
WHOWON?
THE ONE.
ONE WON?!
MR THE ONE, CAN YOU PUT THE 1's BACK IN BILL'S IDENTITY MATRIX?
IT IS DONE.
PARTY ON DUDE!
?!
BILL'S IDENTITY IS RETURNED...
THANKS A KNOT!
TIME FOR US TO TAKE A COORDINATE CHART HOME!
... AND BACK TO REALITY
HMMM... I JUST HAD THE STRANGEST DREAM...
$\begin{bmatrix}4 & 1\\3 & 2\end{bmatrix}\begin{bmatrix}2\\-1\end{bmatrix}=\begin{bmatrix}7\\2\end{bmatrix}$
Zzz
KNOT MAN! MASTER OF THE MATRIX!
1
$\lambda_1 \lambda_2 \lambda_3 \ldots \lambda_n$
QED

$$\mathrm{Re}(\text{☺}) = \text{☺}$$

$$\mathrm{Im}(\text{☺}) =$$

$$\nabla \times (\text{☺}) = \text{☺}$$

$$\nabla(\text{☺}) = \text{☺}$$

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