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## Poems Taken from "An Evening of Mathematical Poetry"

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## POEMS TAKEN FROM "AN EVENING OF MATHEMATICAL POETRY"

Held on January 10, 1992  
National Joint Mathematics Meetings  
Baltimore, Maryland

### ODE BY AN INVETERATE PAPER GRADER

(with apologies to Edgar Allen Poe and his pet bird?!) )

*John H. Hodges*  
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Boulder, Colorado 80309-0426

Once upon a midnight dreary,  
As I pondered weak and weary,  
Over proofs both short and longer,  
In styles that could be stronger,  
Trying to keep track of pages,  
When not numbered, mixed in stages,  
If not stapled, they got shuffled,  
Frustrated sighs and barely muffled.  
As I tried to judge if valid,  
Gradually my face went palid,  
As I searched both earth and sky  
For quantifiers on both  $x$  and  $y$ ,  
Will I find them, I implore?  
QUOTH THE RAVEN "NEVERMORE"!

### LIMERICKS 1: MOTLEY MATHEMATICAL MUSINGS

(with apologies to the great mathematicians named)

*by John H. Hodges*

1. Ahmes was an Egyptian scribe, (Rhind Papyrus,  
With practical problems he did vibe, 1650 B.C.)  
He wrote on papyrus,  
Inspired by Osiris,  
About bread and beer to imbibe.
2. In Miletus Thales worked we're told, (~ 600 B.C.)  
To create a method, new and bold:  
'Tis not enough to just "grove" it,  
You really must prove it,  
If for eons you want it to hold.
3. Pythagoras was a secretive man, (~ 585-500  
Founded a club that he also ran, B.C.)  
The whole numbers they studied,  
by irrationals were muddied,  
But their work still makes you a fan.
4. Archytas was a versatile chum, (428-347  
A leading citizen of Tarentum, B.C.)  
Taught Eudoxus how to add,  
Friend of Plato, made him glad,  
Found mean proportionals too, by gum!

5. Eudoxus was a brilliant man, (~ 408 -  
If he can't do it nobody can, 355 B.C.)  
He promoted proportions,  
Rescued Pythagorean fortunes,  
His method of exhaustion is gran(d).

6. Eratosthenes from old Cyrene, (~ 230 B.C.)  
Whose frames yield two proportions mean,  
With calculations ringed the earth,  
And long before Magellan's birth,  
His sieve leaves primes caught in between.  
(And so we're glad he made the scene.)

7. Chou-pei was a famous treatise, (~206 B.C.  
Said the Greeks, "It may have beat us," - 222 A.D.)  
But Pythagoras will live, or earlier  
No proof did "Chou" give,  
So there is no "Chou-pei's Theorem" to greet us.

8. Menelaus and (Claudius) Ptolemy, (~ 100  
Both loved trigonometry, A.D.)  
The first worked mainly on the sphere,  
The second made Hipparchus clear,  
In his "great" book of astronomy.

9. Good old Pappus wrote a guide, (~ 300  
To the math that gave Greeks pride, A.D.)  
If he hadn't known it,  
Then no one had shown it,  
His "Collection" was both deep and wide.

10. Theon was a "commentator", (~ 390  
Not a true originator, A.D.)  
But his comments on Euclid,  
Made geometry lucid,  
So he wasn't just an idle spectator.

11. Proclus was a Neoplatonist, (5th  
Of Euclid's work he gave the gist, Century A.D.)  
His "Eudemian" summary  
Gave us Geometry's history,  
Which otherwise would be lost in the mist.

12. Li Yeh liked to work with digits, (1248-  
But negative numbers gave him fidgets, 1259 A.D.)  
So, in numerals, with dash,  
He inserted a slash,  
To change them from posits to negits.

13. Yang Hui lived in ancient China, (1261 A.D.)  
"Pascal's Triangle" was his line-a,  
He wrote it down first,  
In an energy burst,  
And so he could claim that, "It's a mine-a."

### OH, AN ALGEBRAIST AND FOUR OTHER MATH-NONSENSE VERSES

*Lewy, Helen*  
(widow of mathematician Hans Lewy)  
70 Whitaker  
Berkeley, CA 94708-1737

Oh, an algebraist known to myself,  
Used to boast that each week without fail,  
He'd invent a new matrix for fun -  
But the poor fellow landed in jail.

Oh, to tackle a lemniscate's boundry or so,  
Is a thing that requires lots of nerve;  
It's a terrible fate to be caught unawares  
On the incorrect side of the curve!

Oh, derangement dropped in on my typist -  
A venus with eyes of obsidian -  
When she mused if the space on her space  
bar  
Was, - or was not, - non-Euclidian!

A math prof who lived in Gillette  
 Was dating a girl friend called Bette  
 Said she, "Tell me Dove,  
 All you know about love!"  
 To which he replied, "Empty Set"!

The equivalent impact on barroom discourse,  
 Let us say, to a half dozen beers,  
 In mathematics, is merely the question, "What  
 if The Jacobean disappears?"

**MATHOETRY  
 IS THERE AN ANSWER**

*Russell Smith Ashman  
 P.O. Box 734  
 Harrisburg, PA 17108*

**MATHOETRY**

8 Arith, Alge, Geo, and Trig;  
 6 Raised in homes strict and firm,  
 8 Family of learning now quite big;  
 8 Making children in classrooms squirm.  
 8 Arabic numbers now we have,  
 6 To them we owe a debt,  
 8 From here began our science math;  
 8 Let's give them thanks, but not our wrath.  
 8 Alge Arab then started small,  
 6 Uniting broken parts;  
 8 Letters and symbols serve their needs,  
 8 As scholars make their feeble starts.  
 8 Geo enhanced its mathy lines;  
 6 As scholars aptly stared;  
 8 Some ancient lands laid out their fields;  
 8 Geo, thru time, has surely fared.  
 8 Alge soon married Geo Math;  
 6 Family size not big;  
 8 They had but one child - famous now;  
 8 They quickly called it baby Trig.

8 Specialist Trig now known to all,  
 6 Loved objects, three-sided all,  
 8 And opened with this new found key,  
 8 A universe that all could see.  
 8 Our calculus, the troubled child,  
 6 Sure makes you stop and think;  
 8 Integral values slowly sink  
 8 Differences that provide no link.  
 8 Arith, Alge, Geo, and Trig,  
 6 Live but misunderstood,  
 8 Family confusing, now quite big;  
 8 Oddly, they are serving our good.

**IS THERE AN ANSWER**

8 Celestial bodies are the dots,  
 8 Of an imaginary line,  
 8 Extending into outer space.  
 8 Space, a geometric object  
 8 Of pure and solid nothingness,  
 8 Defines itself with vague symbols.  
 8 Numbers are limited symbols,  
 8 Which measure the unlimited,  
 8 Impenetrable lines of space.  
 8 Math and space are inseparable;  
 8 Space suffocates math, even while  
 8 Math correctly describes its strengths.  
 8 An empirical mind grapples  
 8 Vainly with non-empirical  
 8 Limitations which it admits.  
 8 Is math a foolish child of space,  
 8 Or is space a fulsome nickname  
 8 For our modern mathematics?

## A NEW SOLUTION TO AN OLD PROBLEM

*Eleanor Ninestein  
608 Merrick Court  
Fayetteville, NC 28311*

The topologist's child was quite hyper  
'Til she wore a Moebius diaper.  
The mess on the inside  
Was thus on the outside  
And it was easy for someone to wipe her.

## MATH BUFFET

*Colin Day  
303 Whaley Street  
Columbia, SC 24201*

Math, the smorgasbord of the Mind run  
loose  
try the arithmetic appetizer or the geometry  
juice  
or the spicy smoked algebra meats  
with tangy cold calculus cheese  
and to wash them all down, perfection in a  
bottle  
ein rein Rein Wein (Klein)  
and for dessert we'll play game theory pies  
until our sucrose sweet complexity dies

## A MATHEMATICIAN'S NIGHTMARE BEAUTIFUL NUMBERS

*JoAnne Growney  
Department of Mathematics and Computer  
Science  
Bloomsburg, PA 17815*

## A MATHEMATICIAN'S NIGHTMARE

Suppose a general store:  
Items with unknown values  
And arbitrary prices,  
Rounded for ease to  
Whole-dollar amounts.

Each day Madame X,  
Keeper of the emporium,  
Raises or lowers each price:  
Exceptional bargains  
And anti-bargains.

Even-numbered prices  
Divide by two  
By half themselves  
And half a dollar more  
To keep the numbers whole.

Today I pause before  
A handsome beveled mirror  
Costing twenty-seven dollars.  
Shall I buy or wait  
For fifty-nine long days  
Until the price is lower?

The price-changing scheme of this poem is derived from the Collatz Conjecture, an unsolved problem that has stolen hours of sleep from many mathematicians. Start with any positive integer: If it is even, take half of it; if it is odd, increase it by half and round up to the next whole number. Collatz' Conjecture asserts that, regardless of the starting number, iteration of this increase-decrease process will eventually lead to the number one.

## BEAUTIFUL NUMBERS

"Ah, you are a mathematician."  
they say  
with fear or admiration  
or a giggle of disdain.

"Then," they say,  
"you must be able -  
I could use you -  
to balance the checkbook."

Reconsider, please!  
Numbers and I  
are more than  
merely useful.

Some numbers, perhaps, are not lovely,  
But there is then,  
the number of my fingers  
Which count all other numbers,  
And there is seven,  
the number of days  
with which I count my life,  
Wonderful four,  
the number of my children,  
Unsurpassed one,  
for all of us together.  
A million stars are not  
more beautiful than one.

## AN ENGLISH TEACHER CONFRONTS ALGEBRAIC NOTATION

*Bonnie Sunstein  
Writing Center  
Rivier College  
Nashua, New Hampshire*

"The factorial function  $f(n) = n!$ ,  $n=0,1,2,\dots$   
is used in the expression of certain important  
probability distributions."

Beaver and Beaver, Study Guide to  
accompany Mendenhall, Introduction to  
Probability and Statistics, Seventh Edition

Behold the exclamation,  
That ancient punctuation;  
Stiff and straight, surrounded by black  
brackets.

Flanked by ranks of numbers,  
O'er the bridge it lumbers;  
Needing multiplying in those jackets.

This army cloaked in Greek  
bodes outcome dank and bleak,  
And doesn't aid solution or decision.

An enemy invasion,  
Each set and each equation;  
Is spitting hot ellipses toward division.

Oh, where's Anticipation?  
And joyous confirmation?  
The exclamation stands as a memorial.

Once delight and sweet surprise,  
Its verbal pleasures soothed our eyes.  
But now it signals us for a factorial (!)

## RANDOM RHYMES FOR NORMAL DISTRIBUTION

Our World is full of strange and odd  
mismatches -  
Whatever fate and circumstance dispatches  
Our job appears in Stats  
To join the these and thats  
So when we sense an itch we'll have the  
scratches.

A family of Chi-Square relations  
Whose nominal, neat observations  
Made curves toward a mound  
Degree-freedom bound  
With infinite sum calculation.

If Pearson had answered his lust,  
And let his Eugenics Chair rust;  
He'd violate labels  
On data and tables  
For f and t measures "robust".

**GOD-137  
RADICAL-2**

*Robert Wilson*  
120 North Woodrow  
Little Rock, AR 72205

**GOD-137**

Sometimes one is some  
unless some is none  
For one to be none  
just can't be done  
Yet sometimes some is square  
and sometimes square is cube  
and someone is three.

$\sqrt{2}$

Continuous  
Associated  
Transformation

+ .014213562. . .

**A DOZEN CLUES TO TRIGONOMETRIC  
FUNCTIONS**

*Shrinivar S. Dalal*  
Embry-Riddle Aeronautical University  
Daytona Beach, Florida 32114

Santa Only Hopes  
Christmas And Hanukkah  
Turn Out Alright.

Chris

Some Old Helicopters  
Crash After Hovering  
To Orlando Airport.

Robert S.

Sometimes Only Heroes  
Can Alter History  
To Our Advantage.

Eric

Some Old Horse  
Caught Another Horse  
Taking Oats Away.

Chris G.

Some Overly Helpful  
Certified Aviators Have  
Trouble Operating Aircrafts.

Phillip

Scuds of Hussein  
Caused Aerial Havoc  
To Our Allies.

Alberto

Silly Old Hitler  
Caused Awful Headaches  
To Our Allies.

Robert P.

Some Old Horses  
Can Always Haul  
Tons of Alfalfa.

Scott

Sperry Our Hungry  
Cat Attacked Harold  
Today Over Anchovies.

Christopher

Selfish Oscar Had  
Candy And Hated  
To Offer Any.

Eugene

Sam Our Hopeless  
Calculus Assistant Had  
Trouble Operating Algebra.

David

Stupid Old Hussein  
Caused Awful Heartaches  
To Our Atmosphere.

Candy

Legend: S = Sine

C = Cosine

T = Tangent

A = Adjacent Side

O = Opposite Side

H = Hypotenuse

## CARTOGRAPHIC CLAUSTROPHOBIA MATHEMATICAL CONFESSION

Frank Bernhart  
63 Crimson Bramble  
Rochester, NY 14623

## CARTOGRAPHIC CLAUSTROPHOBIA (A FOUR COLOR HISTORY TOUR)

ONE color, TWO color, THREE-and-FOUR,  
in coloring maps, do WE-need-more?  
The map of England, Guthrie tried,  
With EXACTLY four he's SATIS-fied.  
So he told DeMorgan, who THEN told  
Cayley,  
And plenty of others - the news spread daily.

PLANE maps or SPHERE maps - it don't  
matter,  
Makes no difference, 'cept in patter.  
But torus and Klein sack, please refuse,  
All higher surfaces you MUST NOT use.  
Abstain from topology, draw simple lines,  
Let the map be described by finite signs  
And using the Kuratowski planarity rule,  
You may trade the map for its planar dual.

TWO color, THREE, FOUR-and-FIVE,  
said Percy John Heawood, not now alive,  
are always enough, and I'll attempt'  
to repair the gap I found in Kempe.  
For years he labored, with great agility  
To make four suffice, with high Probability,  
Accompanied by false proofs, dare we  
mention?  
The authors could hold a crackpot  
convention.



Now, finally, thankfully, the answer's FOUR,  
in colorful cartography- no NEED for more.  
And what team broke the century-long spell?  
None other than Haken and his FRIEND  
Appel.

The easiest direction, discharging, entails  
pages and pages of tiny details.  
The other direction, reduction, is cuter:  
here billions of steps were left to computer.

DISCHARGE-ing, REDUCE-ing, what's  
that get?

An awkward and large unavoidable set,  
Kempe's methods were extended, as though  
on a leash  
considerably lengthened by Birkhoff and  
Heesch.

Plus a tribe of coworkers who nobly increased  
The list of reductions without help in the  
least  
from computers. Some people say "It's a  
cheat  
Your proof is in part an unprintable feat."

ONE year, TWO years, THREE-and-FOUR,  
Better throw in a dozen more.  
The years roll by, the proof is firm,  
just a few little errors to MAKE them squirm!  
But all are soon fixed, better THINGS to do.  
A nice short proof is NOT in sight,  
Better to avoid all colors, and PAINT things  
white!

\*\*\*\*\*

DIRECTIONS: read like 'Higgledy-  
piggledy, My Black Hen', or 'The Wonderful  
One-Hose Shay', contrasting smooth and  
staccato phrases.

## MATHEMATICAL CONFESSION

I'll tell you why to salute Robert Bly,  
(who wrote "Iron John" to help stuck men  
move on);  
He files 'mathematician' as subspecies  
"magician"  
or mythologist/cook (page 228 in the book).

The Cook belongs to the innermost ring,  
with Warrior, Trickster, wild Man, King,  
also Grief-man and Lover, whose archetypal  
power  
can act to bring 'deep manhood' to flower.

Should emotional body be crippled in Youth,  
the Mythologist/Cook may haply survive,  
Use intellectual energy to trace out the truth,  
and then ascend to keep sane and alive.

With energies invisible he can converse,  
And become a mathematician or worse!  
His wise ascension: Perhaps that is why  
the naive man gets born and beholds the sky.

To communicate notions he will need the  
emotions,  
and somehow recover the feelings of lover,  
to project X,Y,Z (do students agree?)  
and now you see why we still *need Robert  
Bly!*

\*\*\*\*\*

DIRECTIONS: Read evenly and quickly,  
with slight pause after each line, a bit longer  
between verses. Each line should gradually  
decrease in pitch and stress; slower on last  
syllable.

## ODE TO A $\Phi$ ?

*Barry W. Brunson  
Western Kentucky University  
Bowling Green, KY 42101*

A thing as lovely as a  $\phi$

I think that I shall never  $\left\{ \begin{array}{l} \text{see} \\ \text{spy} \end{array} \right\}$ . [Choose one.]

If you want to make  $\phi$  rhyme with "see",  
But if you're really determined to be  
Consistent, admit  
Though it doesn't quite fit,  
That a disk measures  $r^2$  times "pea".

Each of  $\xi, \pi, \phi, \chi, \psi$  will claim  
an identical rhyme for its name.  
Before you get hot,  
Check Liddell and Scott<sup>1</sup>;  
Give them, not the author, the blame.

## TO MY LITTLE ONE

*Peggie A. Smith  
University of D.C.  
Department of Mathematics, MB4203  
4200 Connecticut Ave., NW  
Washington, DC 20008*

The Hindu Arabic alphabet to thee is  
sounding letters a to z, Or learning  
phonics at the age of three while  
sitting on your daddy's knee. But  
soon you will learn there are deeper  
meanings to discern the universe. All  
its wonders leave a lifetime of phenomena  
for an ebullient mind to blunder. Even  
the Greeks have their own set of letters  
of the alphabet, although you have not  
learned these as of yet...there is still time.

a is acceleration due to gravity  
b is a y-intercept in coordinate geometry  
c is celsius or centigrade  
d is the distance from A to B  
e is the base of the exponential function  $y = ex$   
f is force due to gravity, g  
h is the height of a pyramid in Africa  
i is the imaginary unit  
j is a vector with magnitude and direction  
k is constant to a degree  
l is the length of the Nile before the flooding season  
m is the slope of a line of course  
n is the unknown who has no voice, but oh,  
o is zero who is greater than negatives and less than positive;  
but still part of reality  
p, q, r, and s are logical statements in Boolean algebra used to analyze complex electrical circuits in the design of electronic digital computers  
t is the time it will take two planes to become 3600 km apart if they both leave Dulles at 2 p.m., one flying south at 450 km/hr and the other flying north at 675 km/hr  
U is now units once ones  
V is velocity which intrigued Newton and Einstein before I was born  
W is work there is much to be done  
x, y, and z are special ones to me because they take me into 3-D and never leave me hanging in space.  
Oh I could go on til infinity; but time is of the essence you see and I must explain the true beauty of it all! It lies in the fact that each letter is pithy and none is constant, not even k!

## MATH ILLUSION

*Ruth Rendle*  
29 Edison Terrace  
Sparta, NJ 07871

I had so much to say  
In the middle of the night.  
I must defend my view;  
That picture was so right.

Myself agreed completely.  
Discoveries could be made.  
Pythagoras was brilliant;  
The groundwork had been laid.

Circle moved about the grid;  
Ellipse evolved with ease.  
Hyperbola could follow;  
My mind began to tease.

The order and the wonder  
Of a system without end  
With interlocking pieces  
That one could pilot and bend.

The beauty of true answers,  
The ideas I would save  
Tomorrow to collect the props  
For the speech I never gave.

### PROOF PANTOUM LINGUA NON-FRANCA

*Melodi Goff*  
1512 George Avenue  
Jefferson City, TN 37760

### PROOF PANTOUM

In Pantoum form set down the proof  
since ancient Euclid noted:  
the numbers prime, they're not finite -  
it's clear by contradiction.

Assume for now primes count to "zed"  
and label them p-subscript:  
{ $p_1, p_2$  ..... until  $p_t$ }  
and now we take their product.

And one to this and call it ipt  
(to keep the form, though awkward).  
Now what of this can we deduct  
regarding some prime number?

By other theorem we have word  
some prime will ipt dispart.  
Now think with me, you will concur  
this prime is not some p-sub.

If ipt is prime, or no, our start  
is now undone, it's unroof'd,  
and prime not p, exists - sweet nub:  
our primes are found in-finite.

### LINGUA NON-FRANCA

Mathematicians all, we must confess  
to our peculiar merriness:

Greek letters in company  
with Arabic numerals ...  
Imaginary numbers doing  
what the Real cannot, because  
we need it done ...  
and the English alphabet  
to add cultural diversity ...  
Symbols used and reused  
(context is everything)  
and a shorthand we devise (iff)...  
Wielded with the power and  
freedom of God -  
"Let 'this' be 'that'" and "There exists..."

Now present it to the world,  
with a straight face claiming  
"It is perfectly clear,  
with the briefest contemplating ."

**MATHEMATICS LITERATURE  
THE MAJESTIC OAK STRONG IN MATH**

*Florentin Smarandache*  
P.O. Box 42561  
Phoenix, AZ 85080

**MATHEMATICS LITERATURE**

Imagine that these poems had been created  
By an-electronic device, though you are not  
Too far! Than what would you have thought?  
If in the most sophisticated labs the  
Scientists are producing human  
Embryos, we are producing souls. According  
To mechanic procedures spiritual states  
Are being made. Programmed algorithms  
In a sophisticated language are producing  
poems  
On a conveyor belt. The writer wearing  
A white overall is watching the bracket  
Of its ordinator when these are creating  
These logic sentiments

It is infant literature for adults  
Or vice-versa. Linear verses tore by  
Non-linear images, metaphoric equations  
Of the insulant abstract systems of thoughts  
Breathing of a second...

As the artificial flowers these poems  
Are imitating the natural flowers

**THE MAJESTIC OAK STRONG IN MATH**

Innocent, diaphanous  
The Spring presents itself  
As the exam...

Young carnations  
Bashfully as pupils  
And ivory butterflies  
Students in biology

Strong in math  
The majestic oak  
Keeps its arms raised  
The white bindweed  
Gets its flower diploma

**COLLABORATION**

*John Klippenstein*  
Mathematics Department  
The University of British Columbia  
Vancouver, B.C. Canada V6T 1Y4

Spiderlike I search for facts  
To anchor my webs of though,  
Strung out to capture the ways of the world

Resting alone where web meets world,  
Waiting for some gossamer vibration,  
I feel no need for any other.

Watching the earthbound ants,  
I disdain their plodding gait,  
their stolid struggle, shouldering immense  
burdens.

When a dream of spider ant collaboration  
Building a vaster, finer web  
Or a subtler colony  
Hidden from probing eyes  
Built of web strong walls  
Impervious to snout and spade,

Sent me sailing down to earth  
Eager to learn the language of the ants

## MATH 101

Fred Gass

Department of Mathematics and Statistics  
Oxford, Ohio 45056

### MCGUFFEY AUDITORIUM

DEC 21, 7.30 P.M.

They are scattered  
In criminologically sound  
Array, a lattice of energy  
Humming with short-answers.

Page Two: they turn,  
Fold and rustle  
Like a rookery unsettled.  
Heads bob and peer  
Until, hovering,  
I have eased them  
Back into normal  
Distribution.

Wood groans, the  
Radiators sigh.

Twisted or taut,  
Even the hair agonizes,  
Pencils poise, dowsing  
For partial credit.  
Eyes maunder across  
Page and wall.

Most of them have fallen  
Into puzzlement.

Cataleptic  
They stare.

## GEOMETRY FOR ME

David Henderson

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Logic can only go so far -  
after that I must see-perceive-imagine.  
This geometry can help.

I may reason logically thru theorem and  
propositions galore,  
but only what I perceive is real.

If after studying I am not changed -  
if after studying I still see the same -  
then all has gone for naught.

Geometry is to open up my mind  
so I may see what has always been behind  
the illusions that time and space construct.

Space isn't made of point and line  
the points and lines are in the mind.  
The physicists see space as curved  
with particles that are quite blurred.  
And, when I draw, everything is fat  
there are no points and that is that.  
The artists and the dreamer knows  
that space is where an image grows.  
For me it's a sea in which I swim  
a formless sea of hope and whim.

Thru my fear of Infinity and One  
I structure space to confine  
my imagination away from the idea  
that all is One.

But, I can from this trap escape -  
I can see the geometry in which I wander  
as but a structure I made to ponder.

I can dare to let go the structures and my fears  
and look beyond  
to see what is always there to see.

But, to let go, I must first grab on.  
Geometry is both the grabbing on  
and the letting go.

It is a logical structure  
and a perceived meaning -  
Q.E.D's and "Oh! I see!"s

It is formal abstractions  
and beautiful contraptions.

It is talking precisely about that  
which we know only fuzzily

But, in the end, and, most of all,  
it is seeing-perceiving  
the meaning that

I AM.

## THIS THING CALLED MATHEMATICS

*Vatsala Krishnamani*

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Freshmen fear it  
Sophomores shove it in  
Seniors survive it  
Researchers unravel it  
Mathematicians mold it  
All admire it  
This thing called Mathematics

When you start, it is a mystery  
When you know a little, it is intriguing  
When you know more, it is amazing  
When you know more and more, it is never-  
ending

At the top, it is sometimes lonely  
But from being fun, it never stops  
This thing called Mathematics

You cannot live without it, some cannot live  
with it

Some love it, some learn to love it  
Frightening to those not understanding it  
Friendly to those handling it wise  
Mystifying to those viewing from a distance  
It is sometimes yielding, sometimes tense  
This thing called Mathematics

If you chase it, it will hide  
If you hide, it will chase you  
Yes, it plays a game with you!  
By the time you think you mastered it  
You realize you do not know enough of it  
You keep wondering what is  
This thing called Mathematics?

2

The circles and the spheres  
The a's and the b's  
The x's and y's  
The Pluses and the minuses  
The derivatives and the integrals  
Are not the only ones  
In This thing called Mathematics

FOR  
If there are no Physics  
Right from the basics  
It is there in all sciences  
And in Arts and Humanities too  
Sans math, everything is a zoo!  
It is very much in the real world  
This thing called Mathematics

The farmers and businessmen use it  
The politicians and artists use it  
Philosophers use it  
The only distinction is  
How one does it

Not who does it  
This thing called Mathematics

Poets like Yeats quoted it  
Writers like Carroll did it  
Kovalevskaya and Noether crowned it  
With Newton, Lagrange, and Hardy,  
Fermat, Ramanujam and Cauchy.  
You and I do it  
This thing called Mathematics

3

It knows no race  
It knows no sex  
It knows no Rich or Poor  
It knows no Religion, that way it is better  
It speaks a language, universal  
That certainly is something special  
In this thing called Mathematics

It welcomes any color  
Black or white or Brown or any other  
Or a shade in between, it does not matter  
In real equal opportunity, a trend setter  
Professors teach, students learn  
Sometimes it could be the other way around  
In this thing called Mathematics!

People call it pure, with theorems proved  
They call it applied, widely acclaimed  
All agree it is unsurpassed  
But what is in a name?  
For it stays the same  
Unaffected by the hue and cry around  
This thing called Mathematics

The zero is not nothing  
It definitely is something  
With no beginning and no end  
The infinity makes it supreme, a super find  
where do you see it? Where do you catch it?  
There is no match for it  
All those in between are special too  
In this thing called Mathematics

4

How many different strings, all making one  
tune!  
What a harmony in variety and a boon!  
It can make Peace and it can make war  
What one chooses, there is no bar  
But we only wish with fingers crossed  
We always make more peace with it  
This thing called Mathematics

What a wonder, What a puzzle!  
What a miracle, What a dazzle!  
What a gift, What a creation!  
What a hard work, What a recreation!  
Who could describe it without exclamation!  
What a surprise, What a tool!  
What a fair deal, How cool!

What a help, What a friend!  
What a marvel, What a blend!  
What a paradox, What a chance!  
What a music, What a dance!  
What a melody, What a trance!  
If only you could fall in love with  
This thing called Mathematics

Times were different in the Sixties  
We often look back at the Seventies  
We just have been in the Eighties  
We are now going into the Nineties  
Marching forward to the turn of the century  
But where would we be if there were  
absolutely  
No thing called Mathematics?

**TEACHER'S GIFT  
CAUSE AND EFFECT  
ODE TO A TRIANGULAR MATRIX**

*Dan Kalman  
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**TEACHER'S GIFT**

Confined you are, have always been,  
by bonds unfelt; by bars unseen.  
But not so I, I soar on wings  
of thought, and thinking, dream these things:  
two worlds made one yet ever two  
apart; a labyrinth traced clear through  
from end to end; a tone more pure  
than Circe's voice; a keep secure  
from even time's travail; a brightness  
that confers the pain of sight  
so keen it pierces to the heart.  
To this and more I am conveyed.

Come, break those chains. Take up the blade  
by Euclid forged, and polished since  
by ev'ry soul who saw its glint  
in reason's fire, and passed from hand  
to hand down all the age of man  
until at last here now we two.  
Hold out your hand, I give it you.  
Your fetters can't withstand its aim.  
Here. Mathematics is its name.

**CAUSE AND EFFECT**

To my students it's anathematical  
To study anything mathematical.  
I want to go on a sabbatical.

**ODE TO A TRIANGULAR MATRIX**

Oh, thou three corner array,  
noblest of matrices:  
Thy divine figure reveals itself  
reflected in multiple zeros  
Exclaiming your secretes in proud display.

Where the common matrix  
guards its determinant  
as a potent talisman  
never to be revealed,  
save after careful incantation,  
arcane mutterings,  
unending and errorless calculation,  
You, oh forthright soul of linearity  
requiring merely a show of sincerity,  
a token computation,  
willingly exhibit your psyche's key elements  
worn in a bold slash,  
yea, a sash,  
and whose product, your determinant  
is offered for our education.

The chaotic matrix  
whose aspect is disordered  
has at its core,  
its very kernel,  
a confused maze of conflicting directions.  
Lest we come to know its true  
meaning, worth, rank,  
it hides this kernel from our sight,  
misleading and confusing us,  
annihilating enemies in secret alleyways  
and under cover of night.

But you, three sided paragon,  
disdain such rank duplicity;  
declaim your true intentions;  
show every multiplicity  
the measure of your heart, your soul,  
your innermost dimensions.



And there is no mistake about the values that  
you hold.  
With characteristic candor that is striking to  
behold,  
and without undue modesty, your honesty is  
tangible:  
your values worn for all to see with pride on  
your diagonal.

And you and all your fellows faithful ever do  
remain  
you multiply together and your offspring are  
the same,  
and in all your combinations, too, your virtues  
are unchanged.

Indeed, you are a model for the race of  
matrix kind.  
In simple fact.  
In artful grace.  
In guileless art.  
In graceful form.  
You show this humble student all that he  
could hope to find.

**GOD LOVES A CURVE!  
HEART BEAT  
INSTANTS**

*Edward E. Chipman  
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God loves a curve!  
Oh, yes - He gives straight lines, as in  
geometry,  
Horizontals for measurement,  
Perpendiculars for elevators,  
Angles, and the like.  
Straight lines are for utility,  
Delineate the object, but leave me cold.

God loves a curve,  
And curves give grace and easy beauty:  
Hills and human forms,  
Marbles, apples, or a rose;  
And that winding railroad track -  
These all entrance the eye as nothing  
straight,  
When looking back or forward we do see  
The rushing symmetry of motion;  
Or when heavenward gazing we  
Do witness sweeping arcs of flight;  
Or waterborne, the billowing tack  
Of sails exulting in the breeze.

Yes, God loves a curve! -  
And I the moon at night  
In scimitar reflection or full-orbed smile.

But most of all I love a curve

In love's full grace,  
Caught in your smile!

For which I wait.

**HEART BEAT**

"Ninety-two million beats a second" -  
So was the report  
From the Boulder, Colorado, lab  
some 20 years ago.  
A vibration rate and measuring of time.

And now we are told a new type of watch  
Measures distinctions,  
Elements of time,  
In fractions so minute  
The normal mind just boggles at the thought!  
Cannot conceive, or doubts this as a fact;  
And raises questions how such things can be.  
Or else accepts them without a quibble.

Such is the trust in science,  
Or scientific men  
Who previously have shown us miracles  
Of thought and planning  
Put to work in deed.  
That furnish in utilities and ease  
A lift to common life, release from toil,  
And greater culture opportunities.

"Ninety-two million beats a second"  
And now much more,  
The measurings of human mind  
Attuned to Nature's laws, discovering  
The intricacies built into cosmic structures  
By Nature's God, the primal Cause.  
And Man's the privilege of searching out,  
Discovering, bringing to light  
The ways and workings, orderings,  
So long hid from human gaze or knowing.

"Have dominion" - so the first command  
To ancient man from his early God -  
"Over what is in the sea and in the air  
And on the earth." - Gen. 1:28  
"Subdue it all," And this he does  
In this our day, to our amaze.

Yet there remains, for his subduing,  
The raw passions of his nature,  
To where truth shall overcome deceit,  
Lover conquer his hurtful hates,  
Justice replace entrenched wrongs,  
Kindness mark his dealings with his fellows,  
And love and fellowship with his Maker  
Be the heart-beat of his living.

### INSTANTS

Time is composed of instants  
Late or soon  
They carry weight of their events,  
Light or heavy, trivial or momentous,  
They spell together the duration  
Of a lifetime;  
And of all history in man's count,

Pre-history also  
Whose moments, years, through science  
estimates  
Do come to mount  
In measurements of space and time  
To lengths tremendous -  
Acceptable but inconceivable  
In their vast spans.

Time is composed of instants,  
Which in their beat and fast repeat  
Are measured in the millions, billions too,  
Within the move of seconds.  
These distances,  
Or small or great in their expanse  
And temporal existence,  
Do boggle and intrigue the mind,  
Infusing awe and wonder, causing us to  
ponder  
On all the beauty, order, systems,  
Creativity; of which we  
You, I, all men are a fine part  
Within the fathomless seas of heaven.

So, should not we  
In these much later days - so well equipped  
With all the instruments of science  
To inform our minds, -  
Enlarge our comprehension,  
Increase perception - should not we  
Do well to hold, assent to  
And in humility confess, declare  
With great Cicero:  
"The beauty of the world -  
Its orderly arrangement of all things celestial  
Makes us confess there is  
An excellent and eternal nature (N)  
Which by all mankind  
Ought to be worshiped and adored!"

$(X - 2)(X - 12) = X^2 - 14X + 24$   
AN ALGEBRAIC POEM

*Thomas F. Mulcrone  
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There's x unknown  
that one takes 12 from.

Could x be the measure of  
the months of your life?

That same unknown drops 2,  
say the misdirections,

The differences  
of our relation.

Multiply the x less 12  
by the x minus 2

And you get, let be,  
your life's number.

Square that x, which  
I know not of you.

From the result subtract  
the 14 times x,

Which is about sum  
Of our bad days,

Now add 24, the 2 happy years  
I have loved you.

Behold! You have again  
your life's number .

That taken 12  
and dropped 2,

Double-negative law renewed,  
are negative no more!

To the x squared  
Of your perfection,

Is added the 24  
of my affection.

A STRANGE BIFURCATION

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A strange bifurcation  
holds in the world  
but the earth things  
are only limited.

The devil is only limited  
the night is limited  
a new morning is in a hurry  
a new light is in a hurry.

And the attractor burns  
again in the eternity  
nothing frightens yet  
holds in the world.

A strange bifurcation takes care of the life,  
the clear dreams won't die away.

**SIMPLE GROUPS  
THE TEST SONG OF G. BERNARD  
RIEMANN**

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What are the orders of all simple groups?  
I speak of the honest ones, not of the loops.  
It seems that old Burnside the orders has  
guessed,  
Except for the cyclic ones, even the rest.

Groups made up with permutates will produce  
some more,  
For  $A_n$  is simple if  $n$  exceeds 4.  
There is Sir Matthew who came into view,  
Exhibiting groups of an order quite new.

Still others have come on to study this thing;  
Of Artin and Chevalley now we shall sing.  
With matrices finite they made quite a list.  
The question is: Could there be others they've  
missed?

Suzuki and Ree then maintained it's the case  
That these methods had not reached the end  
of the chase.

They wrote down some matrices just four by  
four  
That made up a simple group; why not make  
more?

And then came the opus of Thompson and  
Feit

Which shed on the problem remarkable light:  
A group when the order won't factor by two  
Is cyclic or solvable. That's what is true.

Suzuki and Ree had caused eyebrows to  
raise,  
But the theoreticians they just couldn't faze.

Their groups weren't new if you added a  
twist,  
You could get them from old ones with a  
flick of the wrist.

Still some hardy souls felt a thorn in their  
side,  
For the five groups of Mathieu all reason  
defied;  
Not  $A_n$ , not twisted, and not Chevalley,  
They called them sporadic and filed them  
away.

Are Mathieu groups creatures of Heaven or  
Hell?  
Zvonimir Janko determined to tell.  
He found out what nobody wanted to know:  
The masters had missed 1 7 5 5 6 0.

The floodgates were opened, new groups  
were the rage,  
And twelve or more sprouted to greet the  
new age;  
By Janko, and Conway, and Fischer, and  
Held,  
McLaughlin, Suzuki, and Higman and Sims.

You probably noticed the last lines don't  
rhyme.  
Well, that is quite simply a sign of the time;  
There's chaos, not order, among simple  
groups,  
And maybe we'd better go back to the loops.

**THE TEST SONG OF G. BERNARD  
RIEMANN**

Let us go then, you and I  
With courses so confused both low and high  
Like a snowstorm frozen on a city  
Let us chalk them up, on a sleazy backboard  
Boards that twist upon a tedious argument  
Of dubious intent  
To lead us to a wholly shaky question...  
Oh, do not ask, "Why is it?"  
Let us prove it lest we miss it.

In the halls the teachers go and come  
Walking on Cantor's continuum

The orange fog that covers up the notes we  
take  
The orange smoke that kept away for Artin's  
sake  
Came smoothly in to cover every space and  
form  
And finding no compactness, took the norm  
Curled twice round all of Eckhart  
Then fogged again a differential form.

And indeed there won't be time  
For the smoke to clear from all those prime  
ideals  
There won't be time, there won't be time  
To prepare all knowledge for those tests we  
meet  
To deal with Galois at those evening meals  
There won't be time to study and compute  
What May and Narasimhan want us to impute  
Before they drop that question on our plates  
No time for all those needed group revisions  
Before the taking of our cake at tea.

In the halls the teachers come and go  
Following Smale's unstable flow

And would it have been worth it, after all  
After the cups, the cookies, and the tea  
There with the variables, both the bound and  
free  
Would it have been worth while  
To seize upon a resolution with a smile  
To deform the complex sphere upon the  
plane  
Or roll it toward some universal adjoint

For they might say, setting red pencil by the  
end  
"That is not what we meant at all  
That is not true, at all."

(with apologies to T.S.E.)