

## Fermat's Last Theorem and Poetry

ABSTRACT. Poems written by well-known mathematicians to celebrate the proof of Fermat's Last Theorem .

*Key words and phrases.* Poetry, Mathematics.

RESUMEN. Se reproducen en su idioma original poemas escritos por reconocidos matemáticos con ocasión de la demostración del último teorema de Fermat.

As a result of a poetry tournament organized by JEREMY TEITELBAUM, to celebrate the WILES & TAYLOR's proof of Fermat's Last Theorem the participating contestants send the following poems:

### I

Fermat's last theorem  
Is a puzzling queer one:  
Squares of a plane  
Wholly squared, aren't arcane;  
Cubic volumes and more, though  
Have no solutions, I'm sure; so  
All postulates otherwise  
Will prove other than wise.

MAURICE MACHOVER

**II**

FERMAT's theorem has been solved,  
 What will now make math evolve?  
 There are many problems still,  
 None of which can cause that thrill.  
 Years and years of history,  
 Gave romance to FERMAT-spree,  
 Amateurs and top men too,  
 Tried to push this theorem through.  
 Some have thought they reached the goal,  
 But were shipwrecked on the shoal,  
 So the quest grew stronger still;  
 Who would pay for FERMAT's bill?  
 So what is now the pearl to probe,  
 The sanrk to hunt, the pot of gold,  
 The fish to catch, the rainboe's end,  
 The distant call towards which to tend?  
 One such goal's the number brick,  
 where integers to all lengths stick:  
 To sides, diagonals, everyone,  
 Does it exist or are there none?  
 Then there are those famous pearls,  
 That have stymied kins and earls:  
 GOLDBACH, Twin Primes, RIEMANN Zeta;  
 No solutions, plenty data.  
 Find a perfect number odd;  
 Through  $3n + 1$  go plod;  
 Will the  $P = NP$ ?  
 Send a code unbreakably.  
 Are independence proofs amiss;  
 Continuum Hypothesis;  
 Find a proof which has some texture  
 of the POINCARÉ conjecture.  
 And so, you see, onward we sail,  
 there still are mountains we must scale;

But now there's something gone from math,  
At FERMAT's end we weep and laugh.

JOHN FITZGERALD

### III

A mathematician named WILES  
Had papers stacked in large piles  
Since he saw a clue  
He could show FERMAT true  
Mixing many mathematical styles  
He labored in search of the light  
To find the crucial insight  
Young Andrew, it seems  
Had childhood dreams  
To prove Mr. FERMAT was right  
He studied for seven long years  
Expending much blood, sweat, and tears  
After showing the proof  
A sceptic said "Poof!  
There's a hole here", raising deep fears.  
This shattered Mr. WILES's belief  
His ship was wrecked on a reef  
Then a quick switcheroo  
Came out of the blue  
Providing his mind much relief.  
Mr. WILES had been under the gun  
But the obstacle blocking Proof One  
Fixed a much older way  
From an earlier day  
And now WILES has his place in the sun.

JONATHAN HARVEY

### IV

With an integer greater than 2  
It's something one simply can't do  
If this margin were fat

I'd show you all that  
but it's not so the proof is on you!

TED MUNGER

## V

The clever men at Oxford  
Computed for hours and hours  
But they none of them found a cube or higher  
As the sum of two equal powers.  
A WILES don from Cambridge  
Cogitated for seven years –  
Eventually told his friends  
“By HECKE I'm moved to tears!”  
“The TANIYAMA Conjecture's true  
My new solution's stronger  
This proof perfects old FERMAT's note  
If marginally longer”

ROBERT VIVIAN HUXLEY,  
with acknowledgement to KENNETH GRAHAME

## VI

Sir WILES wrote home to his mama  
And said, “I've improved TANIYAMA.”  
His mother replied,  
“I am filled with such pride . . .  
And to think, I once changed your pajamas.”

## VII

Said WILES, “I know it's for real  
I've proven this theorem with zeal.”  
His doubters then said  
“You're out of your head . . .  
You've just reinvented the WEIL.”

JONATHAN MATTE

**VIII**

A mathematician named Pierre  
Thought “I wonder if someone will care  
If I say there’s a proof  
And then (somewhat aloof)  
Admit I can’t fit it in there.”

JONATHAN MATTE

**IX**

What is a ‘theorem’?  
and what was FERMAT’S?  
Personally,  
I prefer cats.

PEGGY RUST

**X**

No higher pow’r can ever be,  
The sum of two of like degree.  
That shouldn’t be too hard to see...

PETER SHALEN

**XI**

The proof of the claim of FERMAT,  
is truly a marvellous tract.  
Did Pierre tease us all  
'cause the margin was small, or his writing was much much too fat?

JOSEPH SHAYA

**XII**

A mathematician named WILES  
Came up with a proof for the files  
He stretched FERMAT’S margin  
And managed to barge in  
Where others lay felled on their trials.

MATT PERRIENS

**XIII**

When FERMAT Vapours clog our loaded Brows,  
 With furrow'd frowns, when stupid downcast Eyes  
 Th'external Symptoms of some Gap within  
 Our Proof express, or when in sullen Dumps  
 With Head Incumbent on Expanded Palm,  
 Moping we sit, our Gaulloise snuffed, deform'd,  
 Sing then, Oh WILES, and TAYLOR, WILES!  
 Oh trio: put FERMAT to our Toils.

BARRY MAZUR

**XIV**

We take an elliptic curve  $E$ ,  
 consider the points killed by 3,  
 This "rho" must be modular,  
 and by facts which are popular,  
 the proof of FERMAT comes for free.

JEREMY TEITELBAUM

**XV**

"My butter, garçon, is writ large in!" a diner was heard to be chargin'.  
 "I HAD to write there,"  
 exclaimed waiter Pierre,  
 "I couldn't find room in the margarine."

EVERETT HOWE, HENDRIK LENSTRA, & DAVID MOULTON

**XVI**

Rational, modular  
 cohomologically  
 WILES and TAYLOR  
 prove they  
 both are the same. Modular, rational  
 nonarchimedean  
 methods now  
 justify  
 FERMAT's old claim.

ANONYMOUS

**XVII**

Once upon a midnight dreary,  
 As I pondered weak and weary,  
 O'er many a quaint and étale sort of cohomology,  
 While inducing representations,  
 I was led to deformations,  
 And the ramifications of modular forms in characteristic  $p$ .  
 So I struggled to break free.  
 Ah, discreetly I conjectured,  
 to myself alone I lectured,  
 As the virile bust of FERMAT wrought its ghost upon my floor,  
 Suddenly there came an insight,  
 that these flat group schemes were finite  
 And I represented functors never dreamed about before.  
 Then my soul began to soar.  
 "TANIYAMA!" I then shouted,  
 As the logic from me spouted,  
 "It all comes down to looking at the prime  $\ell$  equals 3!"  
 Modularity is the conclusion,  
 And the FREY curve an illusion,  
 So FERMAT's equation cannot have nontrivial roots in  $\mathbb{Z}$ !  
 Quoth the raven, "Q.E.D".

MATT BAKER

**XVIII**

With a little ingenious phrasing,  
 The proof's detail is not quite as dazing,  
 It's enough just to dream,  
 Of a finite flat scheme,  
 and to say that the proof is amazing.

ALF VAN DER POORTEN

**XIX**

I'm beginning to see the attraction,  
 in deformation 'n complete intersection,  
 I no longer fear 'em,  
 'cause FERMAT's Last Theorem,  
 Demands that they have our affection.

ALF VAN DER POORTEN

**XX**

A reckless young fellow from Burma,  
 Found proofs of the theorem of FERMAT.  
 He lived then in terror,  
 Of finding an error,  
 WILES's proof, he suspected, was firmer.

**XXI**

They said the proof was long and hard,  
 and painful to behold,  
 But at the conference at BU,  
 we got the real dirt.  
 The proof, it sure is tricky,  
 but its length isn't so bold—  
 It doesn't fit the margin,  
 but it does fit on a shirt.

FERNANDO GOUVEA

**XXII**

The time has come, FERMAT opined,  
 to talk of many things,  
 of  $GL_2$  and flat group schemes,  
 and local HECKE rings,  
 and which ideals are EISENSTEIN,  
 and WILES's wild flings.

JOE SILVERMAN



**XXIII**

Roses are red,  
 violets are blue,  
 FERMAT is dead,  
 but his theorem is true.

ANONYMOUS

**XXIV**

(A Clerihew)  
 Andrew WILES  
 After seven years' tribulations and trials  
 Saw light at the end of the Tunnell  
 Covering  $E$  by  $X_1(l)$ .

**XXV**

(Double Dactyl)  
 Higgledy-piggledy  
 FERMAT's Last Theorem's  
 Finished at last, though old  
 Pierre might have cursed:  
 "Huge deformation rings?  
 Semistability?  
 Cocycles? Crystals!? My  
 Margins would burst!"

NOAM ELKIES

**XXVI**

*Ode to Fermat*  
 In around 1640, FERMAT,  
 upon his reading of DIOPHANTUS  
 Was led to a romantic assertion that would  
 From that point on entrance us  
 Never did he dream that a few words in a  
 margin could make him a hero  
 As he wrote that certain equations had no

solutions other than zero.  
Many searched for a proof and there may  
have been the rumor,  
It looks a complete solution will  
be found soon by KUMMER.  
This was not the case and a proof would  
not appear out of thin air,  
but perhaps using the curve of FREY and  
and conjecture of SERRE  
This strategy indeed works as proven by  
RIBET, TAYLOR, WILES, and WILES  
Causing the mathematical community at large  
to don tearful smiles  
Thus although now the spirit of FERMAT  
is finally content  
He is shocked that the proof is not just a  
simple method of descent.

E. B. BURGER

## XXVII

We study the proof of FERMAT.  
Take SHIMURA-TANIYAMA  
And the FREY elliptic curve.  
Between them there is a tie  
As suggested by Gerhard FREY.  
Along came Jean-Pierre SERRE  
Who formulated with great care  
The epsilon conjecture  
Which as a tie would serve.  
And yes the conjecture did fit  
As demonstrated by RIBET.  
Then it remained to consider  
Representations modular.  
Seven years later,  
Came the announcement of WILES.

But that was not the ending,  
We needed the TAYLOR mending.  
Now at last we all have smiles.  
SHARON ANN KINEKE