

Is (Some) Mathematics Poetry?

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The association of mathematics and poetry is ancient. It is recognized by both mathematicians and poets. The connection has been made in many different ways. I am going to take it in a way that has not really been explored.

The idea is contained in a recent article by Joanne Growney in the *Mathematical Intelligencer*. In the article, Growney describes the many ways in which poetry and mathematics have collaborated—poems about mathematics, mathematically structured poetry, poems with mathematical imagery.¹ She goes on to suggest that some mathematics may actually be poetry, but that it would need translation for it to be appreciated by non-mathematicians.

For some years I have toyed with the idea of composing mathematics as poetry. I believe that there is mathematical poetry that can speak to everyone, that needs no translation. I have little reason for this belief. Indeed, I have direct evidence to the contrary—the poems I’ve submitted have been rejected without comment.² But I am optimistic. I’m pushing the idea now with the hope that mathematicians and poets working in the genre will succeed.

Mathematics That is Poetry

Rather than consulting definitions of poetry, I thought to create works which act on the reader as poetry acts. One reads a poem and understands one level immediately, a story, an image. But beyond that level, one senses deeper truths, thoughts not stated but hinted or implied by the words. A poem can kindle a sense of wonder—can it be true that—? And of course the very structure of the poem can have aesthetic qualities that, in addition to pleasing, can enhance the message, the thoughts, the truths of the poem.

¹This journal, in its earlier incarnation as the *Humanistic Mathematics Journal* contained many examples of poems by Growney, Marion Cohen and others. Growney recently edited an anthology, *Strange Attractors: Poems of Love and Mathematics*, published by A. K. Peters.

²Well, I started at the top. I sent them to *The New Yorker*.

In that sense, it seems to me there is a genuine mathematical poem. It is a poem that most mathematics students encounter (and are charmed by) in high school. The original poet is unknown.

$$\begin{array}{cccccccc}
 & & & & & & & 1 \\
 & & & & & & 1 & & 1 \\
 & & & & & 1 & & 2 & & 1 \\
 & & & & 1 & & 3 & & 3 & & 1 \\
 & & & 1 & & 4 & & 6 & & 4 & & 1 \\
 & & 1 & & 5 & & 10 & & 10 & & 5 & & 1 \\
 1 & & 6 & & 15 & & 20 & & 15 & & 6 & & 1
 \end{array}$$

I have edited the poem (the original has infinitely many lines). If this is not mathematical poetry, I don't know what is.

The poem is, of course, symmetric. Countless millions have seen the lines. They understand how it is put together. They understand how it will grow. They quickly see patterns. They wonder if the patterns they see will persist. They wonder what further patterns can be found. More individuals have found pleasure and inspiration in this work than in most of the verses written in English or any other language.

Six Poems

I have nothing to rival the Triangle, but it captures what it is that I wish to do. It has form. There is an easily grasped logic. It hints at deeper meanings and lures the reader to imagine and contemplate.

I offer the poems in the next few pages with no explanation. They have no titles, unless you count the numbers as titles. A title is sort of an explanation. A mathematical poem that needs to be explained (especially to readers of this journal) will have failed.

1.

$$\begin{aligned}(1)^2 &= 1^3 \\(1+2)^2 &= 1^3 + 2^3 \\(1+2+3)^2 &= 1^3 + 2^3 + 3^3 \\(1+2+3+4)^2 &= 1^3 + 2^3 + 3^3 + 4^3 \\(1+2+3+4+5)^2 &= 1^3 + 2^3 + 3^3 + 4^3 + 5^3\end{aligned}$$

2.

$$\begin{aligned}2 &= 2 \\ \sqrt{2} &= 1.414214\dots \\ \sqrt{2 + \sqrt{2}} &= 1.847759\dots \\ \sqrt{2 + \sqrt{2 + \sqrt{2}}} &= 1.961570\dots \\ \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2}}}} &= 1.990369\dots \\ \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2}}}}} &= 1.997591\dots \\ \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2}}}}}} &= 1.999398\dots\end{aligned}$$

3.

One.

One 'one'.

Two 'one's.

One 'one' and one 'two'.

Three 'one's and one 'two'.

Two 'one's, one 'two' and one 'three'.

Three 'one's, two 'two's and one 'three'.

Two 'one's, two 'two's and two 'three's.

One 'one', four 'two's and one 'three'.

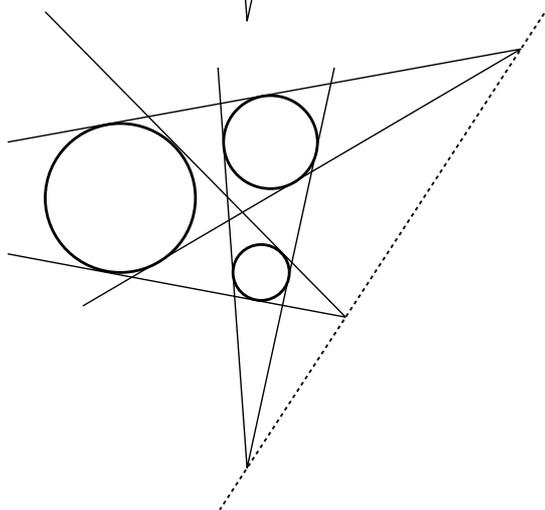
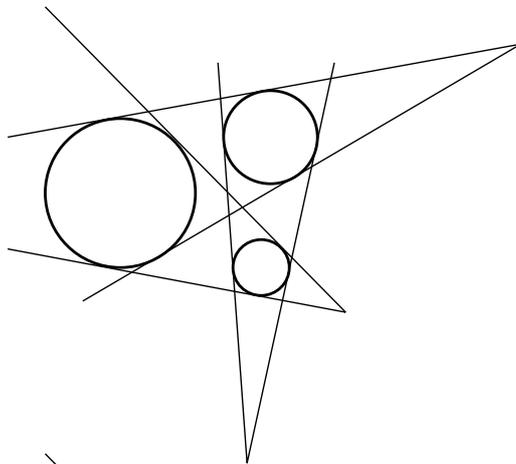
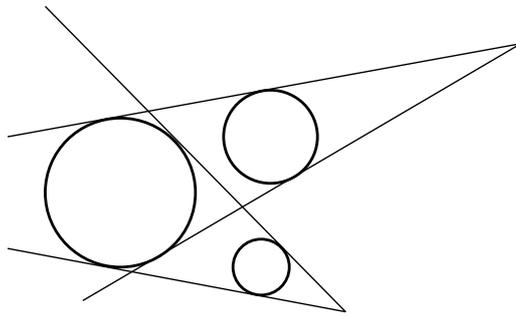
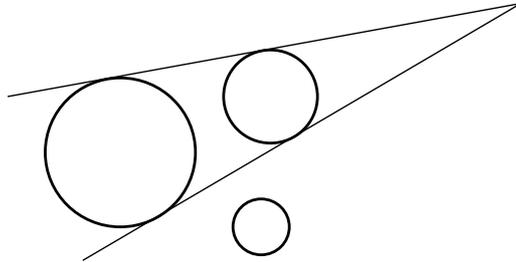
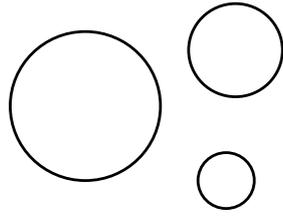
Three 'one's, one 'two', one 'three' and one 'four'.

Four 'one's, one 'two', two 'three's and one 'four'.

Three 'one's, two 'two's, one 'three' and two 'four's.

Two 'one's, three 'two's, two 'three's and one 'four'.

4.



6.

One line of this poem—only one line—is true.

This is the second line of the poem.

No one understands this poem—no one—but you.

References

Cohen, Marion, *Crossing the Equal Sign*, Plain View Press, 2007.

Glaz, Sara and Grownney, JoAnne *Strange Attractors: Poems of Love and Mathematics*, A. K. Peters, Ltd, 2008.

Grownney, JoAnne “What Poetry Is Found in Mathematics? What Possibilities Exist for Its Translation?”, *The Mathematical Intelligencer*, vol 31, No. 4, 2009.