# Collaboration in Creating The Mathematical Poem

Carol Dorf
Mathematics Department, Berkeley High School
1980 Allston Way, Berkeley, CA 94702 USA
Carol.dorf@gmail.com
Web Journal: talkingwriting.com

**Abstract**

Mathematical poetry is the collaboration between two distinct ways of organizing knowledge, mathematics and poetry. While mathematics uses a primarily symbolic language to analyze the world, poetry uses the sound and echoing patterns of natural language. In this workshop participants will experiment with language and structures from both domains in order to compose new poems, as well as read poems that employ mathematical language and techniques.

**Workshop goals and exercises.** The workshop will consist of writing games, exercises and discussion of techniques for creating future work. Participants will experiment with mathematical writing games and develop an understanding of techniques to create mathematical writing exercises for themselves and their students. Furthermore they will collaborate with each other in generating mathematical poetry exercises and experiments.

**Initial Experiments.** For the first segment of the workshop, participants will play a dice game where numbers on the dice correspond to a wordlist to generate 10 words to begin a short piece of writing. This exercise is designed to be low stakes and to serve as a warm-up for writers to become comfortable in the process workshop setting.

**Direct Use of Mathematical Phrases in Poetry.** For this exercise, participants will write pantoums, a poetic form where the second and fourth line of each stanza becomes the first and third line of the subsequent stanza. The final stanza ties this together where the third line of the initial stanza become the first line of the last stanza and the first line of the initial stanza becomes the final line of the poem. Generally, in contemporary use, the pantoum does not have a rhyme scheme, while the line lengths tend to be regular.

Here is a sample mathematical pantoum. In this poem, you can see how the second and fourth lines come from the text of a mathematics book that Glaz was reading. In the final stanza, lines one and three of the first stanza are also repeated.

**A pantoum for the power of theorems** by Sarah Glaz [1]

*The power of the Invertible Matrix Theorem lies*
*in the connections it provides among so many important*
*concepts… It should be emphasized, however, that the*
*Invertible Matrix Theorem applies only to square matrices.*
—David C. Lay, "Linear Algebra"

The power of a theorem lies
In the connections it provides
Among many important concepts
Under a certain set of assumptions

In the connections it provides
We are always able to find
Under a certain set of assumptions
Some that fell through the cracks

We are always able to find
Neglected aspects of ourselves
Some that fell through the cracks
Left unexplored by mathematics

Neglected aspects of ourselves
(The power of a theorem lies)
Left unexplored by mathematics
Among many important concepts

While when first reading or writing a pantoum the form seems difficult, it has the advantage of providing momentum between stanzas so that the writer can use the repeating lines to structure the poem. In this workshop participants will have a choice of using phrases from familiar mathematical texts, or from texts outside their fields.

**The Converse Poem.** For this exercise, participants will read "The Three Oddest Words," by Wislawa Szymborska. Together they will brainstorm statements and their converses. Then participants will write a poem that contains a statement and a converse, or statement that contradicts itself.

**The Three Oddest Words** by Wislawa Szymborska [2]

When I pronounce the word Future,
the first syllable already belongs to the past.

When I pronounce the word Silence,
I destroy it.

When I pronounce the word Nothing,
I make something no non-being can hold.

**Discussion and the Creation of Exercises.** Participants will consider further model poems including "A Throw of the Dice, " by Stéphane Mallarmé, "Statistics," by Wislawa Szymborska, "Bird Singularities," by Alice Major, and "Margins," by Larry Lesser. Then in collaboration with the topics they study and teach in mathematics, they will brainstorm new exercises for themselves and their students.

**Summary.** Through writing a series of mathematically based poems, participants will begin to see ways to incorporate mathematical writing into their own writing practice and their classrooms. Participants will also be able to create new exercises for themselves and their students.

**References**

[1] Sarah Glaz, "A pantoum for the power of theorems," reprinted in Intersections: Poetry With Mathematics, JoAnne Growney, Editor/Publisher, https://poetrywithmathematics.blogspot.com/2013/03/power-of-theorem.html
[2] Wislawa Szymborska, "The Three Oddest Words," http://www.nobelprize.org/nobel_prizes/literature/laureates/1996/szymborska-poems-3_en.html