Inspire Math-Girls-Women (perhaps with poems)

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Abstract

Many poems have been written to honor famous people. Occasionally the subject of such a poem is a mathematician and a few of these mathematicians are women. Sometimes poems are written about the experiences of learning mathematics – and once in a while these poems offer a positive view of these experiences and on rare occasion such poems feature girls. This paper selects and presents an array of stanzas that focus on math girls and math women. My hope, as author, is to start a dialogue and a chain of activity that expands opportunities and recognition for math-girls. In this article you find my voice; I hope what I say will encourage other girls and women to use their voices toward the same ends – and possibly with poems.

Introduction

My current concerns about how women relate to mathematics and how math-women are portrayed to the outside-of-math world are shaped by the fact that I now have seven granddaughters, six of them school age and all of these liking math. I want these girls to continue to find encouragement in mathematics, to continue to like mathematics – and I want their math experiences to be as normal as school lunches, as much fun as recess. I want them to like math without being excluded from friendships, to be able to combine mathematics with athletics and femininity and whatever quirkiness they choose. In short, I want their world to be free of limiting stereotypes of STEM girls and women.

My concerns for math girls have roots in my own childhood – when I enjoyed math but also was interested in other things, when my need for social acceptance kept me quiet about my math skill. I might have given up on math and majored in English and creative writing – but I was able to finance college with a science scholarship. Not only could I not afford to change my major when there were no girls in my advanced classes, but it was also the case that no one of my professors encouraged graduate school even though my only non-A in math was a B+ in the first semester of "Introduction to Modern Algebra." Indeed, I was nearly fifty before I had a good friend who was both a math person and a woman. And recently I chatted with a math major at University of Maryland who was getting ready to change her major because advanced courses enrolled so few women and her friends were all outside of math.

Poems about Girls/Women and Math

On the next pages are some poems to explore; each of these may be found in my blog, "Intersections – Poetry with Mathematics," available at http://poetrywithmathematics.blogspot.com. This blog grew out of a collection of math poems that I began gathering in the 1980s – some of mine and many more by other noted poets – and sharing with my students. Initial postings to the blog were in March 2010 and now the posts number more than 600; a SEARCH BOX enables visitors to find poems by topic or poet.

The first three poems are my own – and they celebrate notable math women; I then offer samples of several poems that deal with a range of mathematical experiences:

This initial poem relates to the loneliness of the math-woman – loneliness experienced by those of us who are/were ordinary math-girls but extending also to the very best. I saw Emmy Noether's portrait at the 1964 New York World's Fair in a poster entitled "Men of Modern Mathematics" and, during the decade of the 1960s as I climbed into the male-dominated world of mathematics, this woman was one of my heroes. Many years later, after reading a biography of this remarkable mathematician, I wrote this poem.

My Dance Is Mathematics [1]   by JoAnne Growney

Down, down, down into the darkness of the grave
Gently they go, the beautiful, the tender, the kind;
Quietly they go, the intelligent, the witty, the brave.
I know. But I do not approve. And I am not resigned.

From "Dirge without Music" by Edna St Vincent Millay; offered by Hermann Weyl
in a Memorial Address for Amalie "Emmy" Nooether on April 26, 1935 at Bryn Mawr College.

They called you der Noether, as if mathematics
was only for men. In 1964, nearly thirty years
past your death, I saw you in a spotlight
in a World's Fair mural, "Men of Modern Mathematics."

Colleagues praised your brilliance--but after
they had called you fat and plain, rough and loud.
Some mentioned kindness and good humor
though none, in your lifetime, admitted it was you
who led the way in axiomatic algebra.
Direct and courageous, lacking self-concern,
elegant of mind, a poet of logical ideas.

At a party when you were eight years old,
you spoke up to solve a hard math puzzle.
Fearless, you set yourself apart.

I followed you and saw you choose
between mathematics and other romance.
For women only, this exclusive standard.

I heard fathers say, "Dance with Emmy--
just once, early in the evening. Old Max
is my friend; his daughter likes to dance."

If a woman's dance is mathematics,
she dances alone.

Mothers said, "Don't tease. That strange one's heart
is kind. She helps her mother with the house
and cannot help her curious mind."

Teachers said, "She's smart but stubborn,
contentious and loud, a theory builder
not persuaded by our ideas."

Students said, "She's hard to follow, bores me."
A few stood firm and built new algebras
on her exacting formulations.

In spite of Emmy's talents,
always there were reasons
not to give her rank
or permanent employment.
She's a pacifist, a woman.
She's a woman and a Jew.
Her abstract thinking
is female and abstruse.

Today, history books proclaim that Noether
is the greatest mathematician
her sex has produced. They say she was good
for a woman.

Amalie "Emmy" Noether was born in Germany (1882) and educated there; she fled the Nazis to the US in 1933 and died on April 14, 1935 in Bryn Mawr, Pennsylvania.

As I have said, being a math-woman can be a lonely situation. I had math-friends and woman-friends but not until I knew Toni Carroll in the mathematics department at Bloomsburg University in the 1980s did I have a math-friend who was also a woman. Beyond the gift of her friendship, Toni was both kind and fearless. And I learned to speak up a bit more. In 2012, when Toni died too soon, I wrote a poem:

Girl-Talk [2]   by JoAnne Growney

> Remembering Toni Carroll (1942-2012) – mathematician,
>   computer scientist, humanitarian, activist, and friend.

When two math-friends visit
the Baltimore Art Museum, on a day
when no non-maths are lurking nearby,
we may -- with no fear of harming --
chatter our mathiness.

When we pass
Max Bill's *Endless Ribbon*
one of us may remark that the Mobius strip
is a math notion peculiarly popular
among non-mathematicians.
 . . .

> This poem continues at http://poetrywithmathematics.blogspot.com/2012/09/a-poem-for-math-friend.html

This next tribute – to Sophia Kovalevsky -- is a poem that has been popular with non-math audiences as well as mathy ones.

With Reason: A Portrait [3] by JoAnne Growney

Sophia Kovalevsky *   (1850-1891)

Because she was Russian . . .
Because she had abundant curly hair . . .
Because she loved mathematics . . .
Because she was born in the 19th century . . .
Because lecture notes for calculus papered
        her nursery walls . . .
Because her parents forbade her to leave home . . .
Because a woman could not travel abroad from Russia
        without her father or a husband . . .
Because she found a kind man to marry . . .
Because ideas came to her in torrents . . .
Because she married a man she did not love . . .

Because her sister died . . .
Because her mind was powerful . . .
Because her passion was mathematics . . .
Because her mentor was Karl Weierstrass . . .
Because she extended Cauchy's theorem
        for partial differential equations . . .
Because she could not care for her daughter
        when exhausted by mathematics . . .
Because she investigated the refraction of light . . .
Because she knew Saturn's rings are unstable . . .

Because she wrote novels and a memoir . . .
Because she struggled with happiness . . .

Because she went to Sweden and the Northern Lights . . .
Because she understood fixed points completely . . .
Because her paper on the Rotation of a Solid Body
        about a Fixed Point won the Bordin Prize . . .
Because she continued Abel's quest to express Abelian
        integrals using elliptic functions . . .
Because she was the first woman professor
        at a European University . . .
Because her colleagues were not women . . .
Because she had a friend -- Anne-Charlotte Leffler --
        and they wrote a play together. . .
Because she dreamed mathematics
        even in a lover's arms . . .
Because a poet wrote "To her whose star shines bright" . . .

Because she caught influenza, complicated by pneumonia,
        at age 41 Sophia Kovalevsky died.

* Russian names have masculine and feminine forms -- and the commonly used spelling "Kovalevsky" has a masculine ending. In Russia, Sophia's surname is "Kovalevskaya."

In this final section, I offer selections of from poems about girls' experiences with math – ranging from delight to discrimination. Insights -- concerning achievements, anxieties, and everyday experiences -- that may lead other math-girls to their own self-expression and understanding. (Links to the complete poems are available in the references [4], [5], [6].)

Jackie Bartley's poem "To the Girl Who Loved Triangles" [4] describes the delight of a young girl with mathematics. Bartley's poem begins this way:

One girl in a friend's preschool class
loves the triangle. Tanya's favorite shape,
the children call it. Simple, three sided, at least

one slope inherent, slip-slide down
in the playground of mind. Tension and its
release. Sure balance, solid as the pyramids . . .

In the 1990's Mattel marketed a Barbie doll that offered sentences such as "Let's go shopping" and "Math is hard." Poet Kyoko Mori examines schoolgirls' relationship to mathematics in her poem "Barbie Says Math Is Hard." [5]   Sharon Olds examines the singularity of a girl good at math in aptly titled poem "The One Girl at the Boys' Party" [5]   Here are samples:

from **Barbie Says Math Is Hard**

by Kyoko Mori

As a boy, I'd still have asked
why Jack must spend exactly
two dollars at the corner store.
Give him a coin purse is as
good an answer as five apples
and two oranges.
. . .
She would tell
her daughters: Yes, math was hard,
but not because we were girls.

from **The One Girl at the Boys' Party**

by Sharon Olds

When I take my girl to the swimming party
I set her down among the boys. They tower and
bristle, she stands there smooth and sleek,
her math scores unfolding in the air around her.
They will strip to their suits, her body hard and
indivisible as a prime number . . .

Emmy Noether suffered discrimination for at least two reasons: she was a woman and a Jew. Here is another such tale, in a poem by Audre Lorde (1934-1992) about a black girl not chosen for the Math Team.

from: **Hanging Fire [**6]   by Audre Lorde (1934-1992)

Nobody even stops to think
about my side of it
I should have been on Math Team
my marks were better than his, . . .

It is my intent that these poetry samples serve as starters for engaging women in roles that support each other as colleagues and friends in mathematics. Two online sites that foster female math connections are Harvey Mudd professor Rachel Levy's blog, *Grandma Got STEM* (which celebrates grandmothers and granddaughters who like math) and a *Women in Maths Facebook* page, initiated by Susanne Pumpluen of the University of Nottingham; links are given in [8] below.

References and Suggestions for Further Reading

Each of the poetry samples above also is found in JoAnne Growney's blog, *Intersections – Poetry with Mathematics*, at
https://poetrywithmathematics.blogspot.com – specific links are given below; a blog SEARCH BOX is available for finding additional poems on numerous topics – including these and other women mathematicians: Emmy Noether, Sophia Kovalevsky, Sophie Germain, Alice Silverberg.

[1] http://poetrywithmathematics.blogspot.com/2010/03/poetry-of-logical-ideas.html (posted March 23, 2010)

[2] http://poetrywithmathematics.blogspot.com/2012/09/a-poem-for-math-friend.html (posted September 15, 2012)

[3] http://poetrywithmathematics.blogspot.com/2013/01/tomorrow-in-san-diego-math-poetry-event.html (posted January 10, 2013)

[4] http://poetrywithmathematics.blogspot.com/2014/12/the-girl-who-loved-triangles.html (posted December 20, 2014)

[5] http://poetrywithmathematics.blogspot.com/2010/06/girls-and-mathematics.html (posted June 14, 2010)

[6] http://poetrywithmathematics.blogspot.com/2010/12/are-all-mathematicians-equal.html (posted December 6, 2010)

[7] Two anthologies including poems that celebrate math-women: *Strange Attractors: Poems of Love and Mathematics* (Eds. S. Glaz and J.A. Growney, A K Peters, 2008). *Numbers and Faces* (Humanistic Mathematics Network, 2001 – out-of-print; available online here: http://joannegrowney.com/numbersandfaces.pdf).

[8] Harvey Mudd professor Rachel Levy's blog, *Grandma Got STEM,* is available at this link: https://ggstem.wordpress.com/ and the *Women in Maths Facebook* page is available here: https://www.facebook.com/womeninmaths.