Poetry of Mathematical Definitions

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Thanks

Sarah Glaz
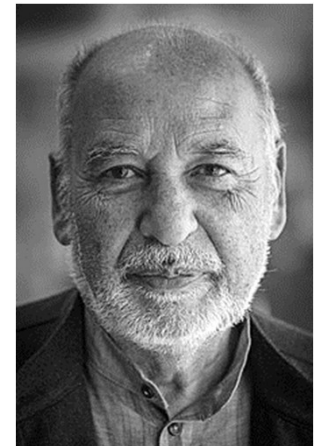
Sofia Kovalevskaya:
"It is impossible to be a mathematician
without being a poet in soul"

Tahar Ben Jelloun:
"Poetry is a form of mathematics, a
highly rigorous relationship with words"

Mathematical Poetry

- **Structure**

- Subject

- Symbols

A Fib \ Y.

1 A
1 Fib's
2 A six
3 Lines poem
5 Whose syllable count
8 Follows Fibonacci's sequence

Mathematical Poetry

- Structure
- Subject
- Symbols

A Woman In Love \ Sarah Glaz

A woman in love sees

A trace of her beloved

In every man she meets:

A gesture or a glance,

A single strand of hair,

The shadow of a smile.

I see a streak of mathematics

In almost everything.

Mathematical Poetry

- Structure

- Subject

- Symbols

Love is anterior to Life \ Emily Dickinson

Love is anterior to Life

Posterior to Death

Initial of Creation, and

The Exponent of Breath.

Mathematical Poetry

- Structure

- Subject

- Symbols

Fixed point theorem \ Y.

My heart is fed by your signs.

When you take no action

You are my contraction

And in the end

My heart must tend

A fixed point.

Poetry

uses aesthetic qualities of language to evoke meanings

A definition

A statement of the meaning of a term

(Source: Wikipedia)

Density \ Y.

I

Feel

Crowded.

Density

Is not space filling.

A point between every two points

Will not let me touch,

Will not fill

The gap.

I'm

Trapped.

A subset of the real numbers is said to be *dense* if between every two real numbers there is an element of the set.
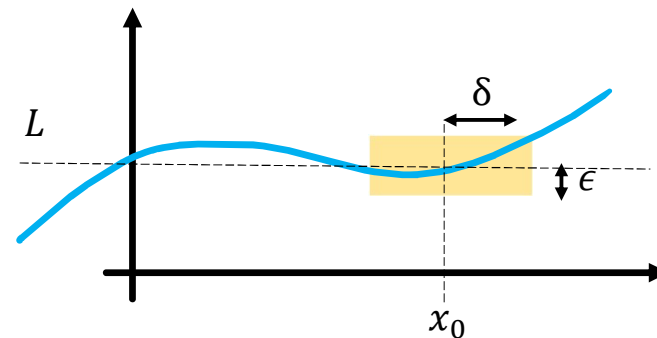
My process

- Pick up a meaningful term

- Follow the meaning

- Take it to my life

- See how far the analogy can go

Limit \ Y.

For every given distance

There exists a moment in time

In which we had been closer.

And even if we are apart now,

The closeness in our past

Cannot be erased,

And even if the gate is locked,

Don't close your eyes.

You can't deny,

There is a limit.

L is said to be the *limit* of $f(x)$ at x_0, if for every given epsilon there exists a delta such that for every point in the delta deleted neighborhood x_0, $f(x)$ is in the epsilon neighborhood of L.

Terms worth poetry

- Nilpotent
- Complete
- Singular

- Defective
- Connected
- Closed, open

Open Closed Open \ Yehuda Amichai (Translated by Chana Bloch)

Open closed open. Before we are born, everything is open

in the universe without us. For as long as we live, everything is closed

within us. And when we die, everything is open again.

Open closed open. That's all we are.

Overcoming challenges

- **Terms that are named after people**
  (the Heisenberg group)

- **Terms that are not fully translated**
  (Eigenvalue)

A prayer to the god of algebra \ Y.

Let me be unipotent

As I'm alone

Can save myself.

Release me

From that nilpotent zero

Who always pulls me back.

Push me forward,

Like a lift of a curve.

There's not a single

Shortest path.

All paths pass

Through the origin.

Origin is where things are born

And labor is painful

And pain is life

And life goes up and down

Like waves,

And waves are everything at all.

Let me surf,

Don't let me fall.

The abyss threatens:

After the fall

There is no measuring

It's depth at all.

Overcoming challenges

- Terms that are named after people
  (the Heisenberg group)

- Terms that are not fully translated
  (Eigenvalue)

You used to be my eigenspace \ Y.

When you are not here,

I'm like a characteristic polynomial

whose roots are not real.

I'm like a sparse matrix

with no specific pattern,

my entries are scattered all around.

And I want to tell you

the good news of my life,

so I call your imaginary phone number

and hear no sound.

Without you I'm walking on air.

You know, mom, you were my ground,

despite your fragility.

You used to be my canonical human being,

now I can be mapped onto so many spaces.

You used to be my orthogonal basis:

Never took your direction,

always perpendicular.

And yet so close we used to be,

sticked together independently.

You used to be my eigenspace,

my place to show off my own value.

But above all,

you used to be.

Some of my poems:

"*Density*" and "*An infinitesimal love poem*": JHM Vol.12 Issue 1

"*Limit*" and "*Fixed point theorem*": Bridges 2021, youtube

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