

# Math Storytelling Day September 25th

infinite sequences and series  $\Rightarrow$   
CALCULUS

Family Math Circle  
2023

Family Math Circle is an informal learning space where participants make advanced mathematics accessible to everyone in kind ways.



## Make Mathematics

Find, write, and illustrate stories that model infinite sequences and series.



## Words With Math Friends

*story, model, metaphor*

sequence, series

convergent, divergent

periodic (repeating), not-periodic

*infinite, infinitesimal, finite*

to iterate, to limit, iteration, limit

## Choices, Choices

Classic math stories help to create a sense of continuity and belonging to mathematical traditions—while new media may resonate with today's feelings and current communities. You can choose to read and watch math stories as they are, or write your own fanfic versions, or write entirely new stories from scratch. Mathematical fiction writers might start with math ideas, then add characters and adventures; other times, writers build fictional worlds first, then seek mathematics within these worlds.

## Toolbox

### Physical:

- ∞ paper, colored pencils or markers

### Virtual:

- ∞ Infinity Elephants  
<https://youtu.be/DK5Z709J2eo>
- ∞ Bach on a Möbius Strip (infinite-loop music) <https://youtu.be/xUHQ2ybTejU>
- ∞ Mathical book collection  
[MathicalBooks.org](http://MathicalBooks.org)
- ∞ Math readers [LivingMath.net](http://LivingMath.net)

[NaturalMath.com/circles/](http://NaturalMath.com/circles/) Extra activities, videos, math connections, books, and other resources for math circle leaders.



Photo: Dr. Sue Looney reading her math storybook, *Ying and the Magic Turtle*

# Math Circle: Happy Math Storytelling Day!

Research Journal by \_\_\_\_\_

Write your name above. Write or draw anything you want below. Add more pages if you want!

## 0. Warm-up: Tell a Math Joke

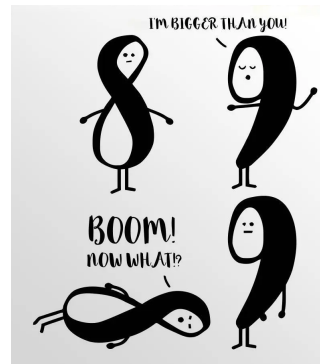
Choose a math joke you know, or find a math joke online, or ask others to tell you a math joke. Once you find a joke you like, show or tell it to someone else.

I asked my dog, what's infinity minus infinity?

She said nothing.

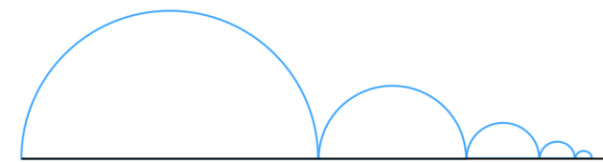


Parallel lines have so much in common. It's a shame they're never gonna meet.



## 1. Playact A Classic Math Story

Many cultures have beloved old stories that share gems of mathematical wisdom. You might have heard of the *Hotel Infinity* story about adding and multiplying infinities, or the *Rice and Chessboard* story about exponential growth. Playact this modern take on a story from 2500 years ago, called *Zeno's Paradox*:



A mathematician and an engineer are playing in a game show. The show host puts a nice prize across the room from them and says that every second, they could travel half the distance between themselves and the prize. The mathematician sighs, "This is impossible! First, I have to cover half the distance between me and the prize, then half of the distance that remains, then half of that distance, and so on. The series is infinite. There'll always be some finite distance left!" The engineer gets up and starts walking. "Ah, well, I figure I can get close enough for all practical purposes."

Are you a mathematician or an engineer today? What do you think the prize is in the story?



Spoiler: If our heroes didn't have to take a second, the infinite series would also end in finite time.

## 2. The Infinite Farm Fanfiction



*Life on the Infinite Farm* by Richard Evan Schwartz is a graphic novel about quirky infinite animals and their (mis)adventures. To celebrate Math Storytelling Day, read some or all of the book, then write about or draw your own infinite creature.

You can download the book here:

<http://www.math.brown.edu/reschwar/99book.pdf>



On the infinite farm, there are creatures that are like infinite sequences, and others that are like infinite branching trees, fractals, or even more exotic mathematical objects. It's a farm, but it's also wild!

## 3. Sing an Infinite-Loop Song

Some sequences go on and on and on, but never repeat. You could count 1, 2, 3,... and on and on and on, and never repeat a number. Other infinite sequences repeat a piece again and again and again. Think day-night-day-night-day-... Songs or poems sometimes have repeating parts, and other times they are entirely periodic. To celebrate Math Storytelling Day, enjoy a song or poem that goes in an infinite loop. Like these:

*This is the song that never ends,  
It goes on and on, my friends!  
Some people started singing it not knowing what it was,  
And they'll continue singing it forever just because  
This is the song that never ends...*

*Infinite bottles of pop on the wall,  
Infinite bottles of pop;  
If one of those bottles should happen to fall,  
infinite bottles of pop on the wall...*

Find or make up more infinite-loop songs and poems.

## 4. Your Own Math Storytelling Traditions



What would you like to do with family and friends to celebrate Math Storytelling Day?

- ∞ What special food would you eat?
- ∞ How would you dress?
- ∞ What greeting cards would you make and exchange?
- ∞ How would you decorate for the holiday?
- ∞ Think of other ways you can make a day special!

Imagine that you have infinite resources in any real or made-up world of your choice. You can play with magic worlds, science fiction, anything from books and movies, or a dream world of your own. How would you celebrate your fantasy Math Storytelling Day?

*Fractal Cookies by Lenore Edman; poster by ExploreLearning*

