

Pi Day Palooza

Did you know that the ratio of the circumference (the distance all the way around) to the diameter (the distance across) of a circle is always equal the same number? The number begins 3.14159, and no matter how many decimal places you take it to, it never ends! This crazy (well, mathematicians would call it irrational) number is called pi. Its symbol looks like this: π



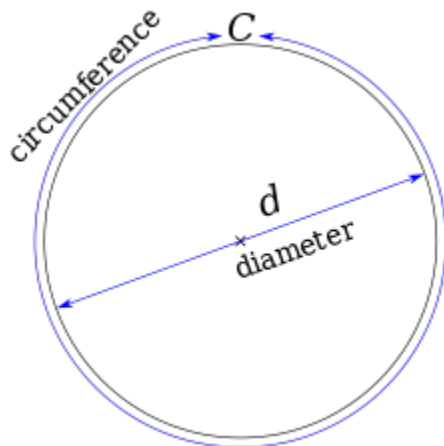
March 14 (or 3/14) is Pi Day! In honor of this international celebration, we've put together some math activities for you to enjoy. For more formal math lessons, check out our Mensa For Kids lesson plans on [shapes](#), [probability](#), [fractions](#), and [Fibonacci numbers](#).

Pi Day Palooza Activity Bundle

Our Pi Day Palooza activity bundle of 5 no-prep, hassle-free pi-themed activities, along with a bonus coloring sheet, is included in this extension. Flip to the end to find it!

Calculate Pi

Calling all circular household items! Measure the diameter and circumference of cans, jars, glasses, bowls (even toilet bowls!), and rugs to see if **you can** find π in your house. To find π , divide the circumference of the circle (all the way around) by the diameter (the length from one side of the circle to the other):



$$C \div d = \pi$$

Try using several different sized circles and see how close you get to 3.14!

Pi Paper Chain

Even the youngest mathematician can participate in this activity! Different colored paper strips are paired with numbers (e.g., blue for 2, red for 4). The strips are then linked in the order of π (3.1415...). The chain can be as long or as short as time and interest allow.

What you need:

- Construction paper of ten different colors cut into strips
- Stapler, tape, or glue

What you do:

- Decide which color will represent which number.
- Create your paper chain by taking a strip of paper in the color you have chosen to represent the number 3 and making it into a loop. Close the loop with a stapler or piece of tape.
- Take a strip that represents the number 1 and thread it through your loop. Close the loop.
- Repeat with the strips that match the numbers in π so that you have a visual representation of π .



How long can you make it? Here are the first 500 decimal places to get you started:

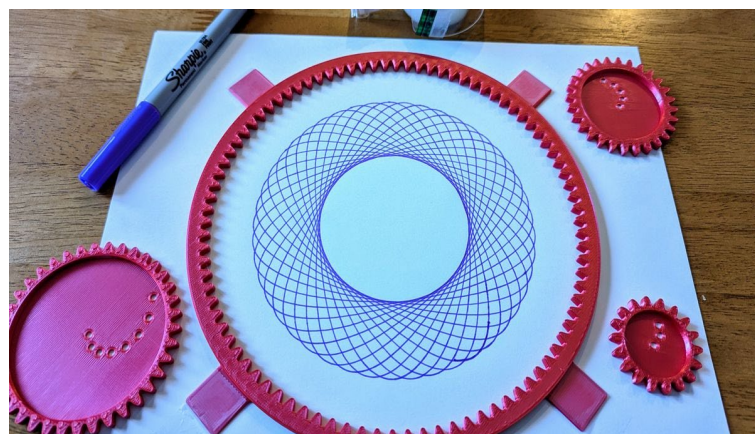
3.14159265358979323846264338327950288419716939937510582097494459230781640628
6208998628034825342117067982148086513282306647093844609550582231725359408128
4811174502841027019385211055596446229489549303819644288109756659334461284756
4823378678316527120190914564856692346034861045432664821339360726024914127372
4587006606315588174881520920962829254091715364367892590360011330530548820466
5213841469519415116094330572703657595919530921861173819326117931051185480744
623799627495673518857527248912279381830119491

A Homemade Spirograph

All it takes is a few minutes with a Spirograph to remind you how fun drawing a plain circle can be!

What you need:

- A round cake pan (or other flat, round pan)
- Cardboard
- Scissors
- A rubber band
- A pencil
- Paper
- Tape



What you do:

1. Measure the diameter of the cake pan.
2. Draw a circle with a diameter half that of the pan. You can do this easily by making one side of the square you use to draw the circle (as described in the activity above) the length you want for the diameter.
3. Trace it on the piece of cardboard.
4. Put the rubber band around the edge of the piece of cardboard.
5. Cut out a piece of paper to fit the bottom of the pan and use tape to hold the paper in place so it doesn't move around.
6. Poke a hole in the middle of the cardboard. If you don't want to make circles, you can get weird shapes by making the hole away from the center of the circle.
7. Put the pencil in the hole and move the circle around the cake pan. Hold the edge of the pan with one hand so the pan doesn't move while you're moving the circle. The circle will guide the pencil to make cool shapes on the paper in the bottom of the pan. Try it with different color fine-tip markers. The circles you're drawing are called hypotrochoids. Cool name, huh?

Use [Martin Gardner's Spirograph](#) to see that same idea on the computer.

(We need to give credit for this idea to Martin Gardner, a mathematician who wrote about cool things to do with math in *Scientific American*).

Pilish Poetry

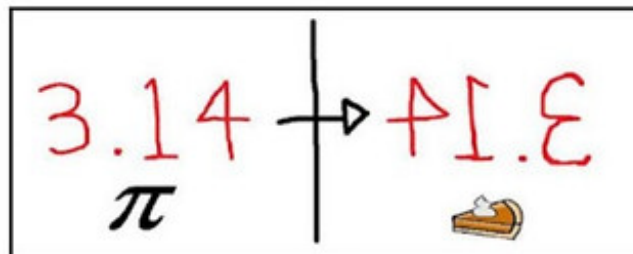
Pilish is a form of writing based on pi. When writing in Pilish, the number of letters in each word used correspond to the digits in pi, meaning the first word will have 3 letters, the second 1 letter, the third 4 letters, until you've reached a stopping point. For example:

Was I just a happy jellyfish, so bouncy, light, and small, drifting clockwise

3 1 4 1 5 9 2 6 5 3 5 8 9

however aimlessly, sea to sea, evermore.

7 9 3 2 3 8



Mensa for Kids Activity Plans

There are a few forms of Pilish – **Basic Pilish**, which treats every 0 digit in pi as a 10-letter word, and no words greater than 10 letters are used, and **Standard Pilish**, which allows writers the freedom to combine smaller consecutive numbers (like 1 and 2) into a single 2 digit number (like 12) so words with more than 10 letters can be incorporated. Pilish can also be **Alphabetic**, which uses only letters and ignores numbers, or **Alphanumeric**, which counts numbers as letters as well.



Pilish can be used as a mnemonic device to help memorize the digits of pi. Try writing your own poem or story in Pilish – see how many digits you can get to! Use this online [Pilish Checker](#) to make sure you haven't miscounted your letters.

Note: *This tool uses Alphanumeric Standard Pilish, so if you've written your poem using Basic and/or Alphabetic Pilish, it may not work.*

Pi Art

Channel your inner artist and create something beautiful for Pi Day. There are lots of ways to incorporate art into your Pi Day celebrations. Here are some examples:

Pi Tape Resist Art

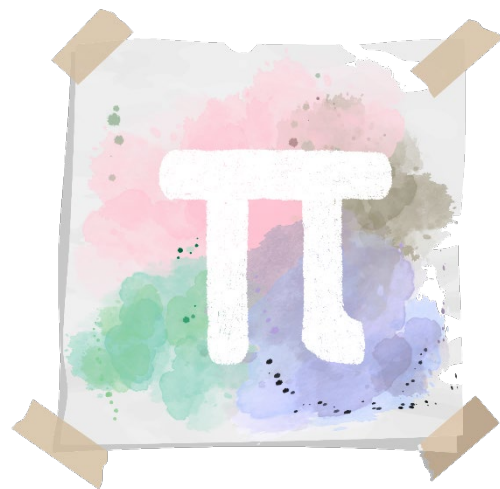
Tape resist art involves strategically placing tape on paper, painting around the tape, and removing the tape to reveal a pattern, image, or symbol in the negative space.

What you need:

- Watercolor paper (or other white paper)
- Watercolor paint
- Paintbrushes or sponges
- Painter's tape
- Dish of water

What you do:

- Use painter's tape to make a π symbol on your paper. Press down on the tape to make sure there are no gaps where your paint can get through. You want your pi symbol to remain white.



Mensa for Kids Activity Plans

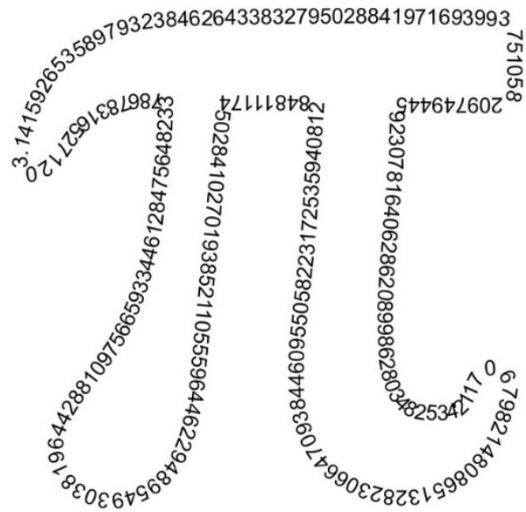
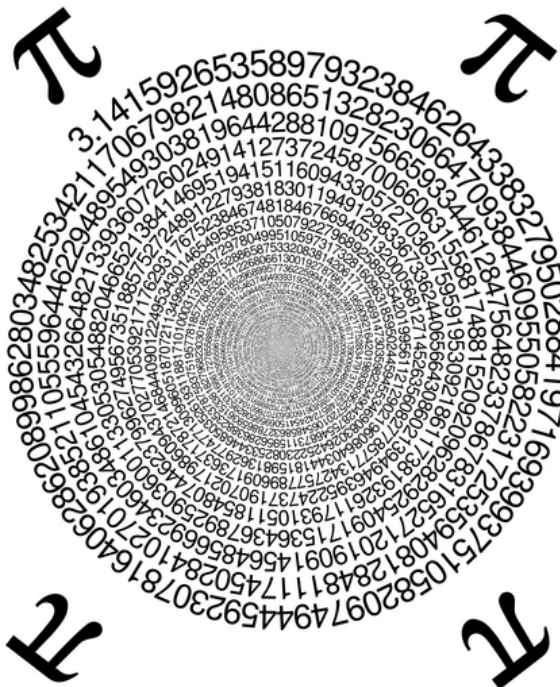
- Use your water to wet your brush, then begin painting around your tape. Add as many colors as you like – you can do a simple border around your pi symbol, shapes, designs, or color the whole page!
- Wait at least 30 minutes for your paint to dry.
- When your paint is dry, carefully remove your tape.

Pi Calligram

A calligram is a type of artistic poetry that mixes words with visual art – artists create an image made entirely out of words that describe, relate to, or in some way represent the subject of the image.

What you need:

- Paper
- Pencil
- Pen or fine tip marker
- Eraser
- Digits of pi (optional)
- Pi vocabulary list (optional)



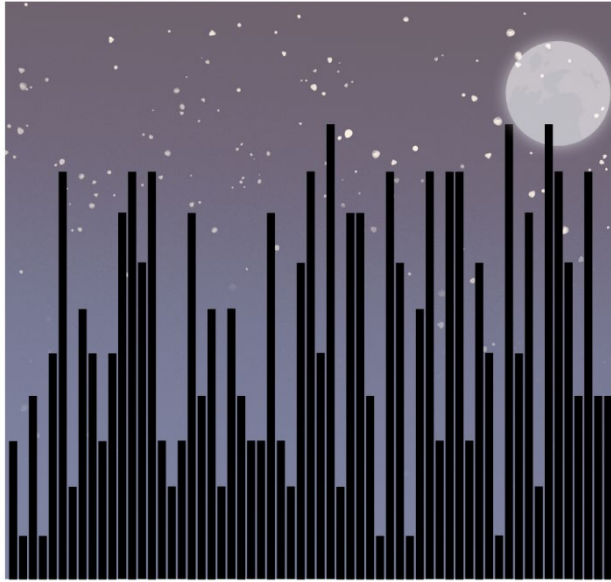
What you do:

- Decide what shape you'd like your calligram to be. We recommend a circle or pi symbol. Then decide whether you'd like to use the digits of pi to create your calligram or words that are associated with pi.
- Sketch an outline of your shape on your paper using a pencil.
- Using your pen or marker, write your words or numbers along your outline.
- When you've completed your picture, erase your pencil outline.

Mensa for Kids Activity Plans

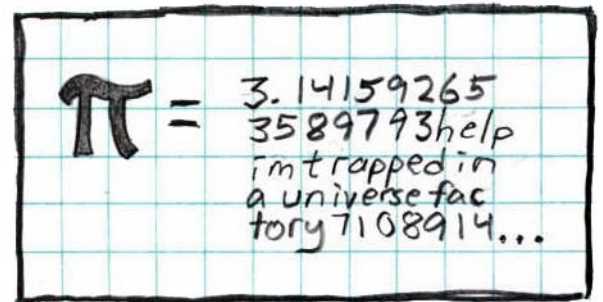
Pi in the Sky

Turn a bar graph made of pi's digits into a city skyline.



What you need:

- Graph paper
- Black pen or fine tip marker
- Colored pencils, pens, or markers
- Digits of pi



What you do:

- Using your black pen, fill in 3 blocks along the y axis (depending on the size of the blocks, you may want to double or triple the number of blocks used for each paper. Whatever you decide, make sure you use the same multiplier for each digit). This will make your first building and your first digit of pi.
- In the next spot along the x axis, fill in 1 block for the next digit of pi, then 4 blocks vertically in the next spot along the x axis, and so on, until you've made as many buildings as you like. For 0s, use 10 blocks.
- Once your pi digits have been graphed, add details to your background. Get creative!

Pi Around the Web

Looking for more Pi Day fun? Check out these websites:

[Pi Day at the Exploratorium](#) - Pi Day history and activities, courtesy of the museum where Pi Day began

[The NASA Pi Day Challenge](#) – Solve problems using pi just like a NASA scientist

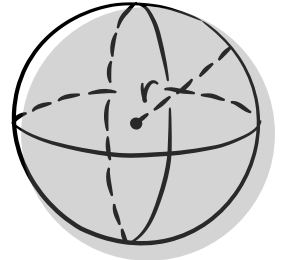
[Your Pi Birthday](#) – Calculate your age in Pi years

[Pi Day Facts](#) – 25 fun facts about pi and Pi day

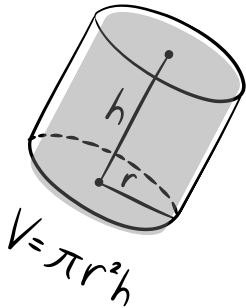
[The Pi Game](#) – See how many digits of pi you know!

π

Pi Day



$$V = \frac{4}{3} \pi r^3$$



$$V = \pi r^2 h$$

Palooza

activity bundle

π

March 14 (3/14) is Pi Day, a day to celebrate the mathematical constant π , or pi (3.14). Pi is the ratio of a circle's circumference to its diameter - on every circle, no matter its size, the ratio will be 3.14159 every time.

Pi Day was founded by physicist Larry Shaw in 1988 and became an official US holiday in 2009. Use these activities as part of your Pi Day celebrations.

What's included:

- Pi Chart
- Scavenger Hunt
- Bingo Card
- Word Scramble
- Pi Word Challenge
- Pi-ku Haiku
- Coloring Sheet
- Answer Sheet

Did you know that the ratio of a circle's circumference to its diameter is always the same number? And no matter how many decimal places you take it to, it never ends! This number is called **pi**, or π . Here are pi's first 500 digits:

3.141592653589793238462643383279
5028841971693993751058209749445
923078164062862089986280348253
4211706798214808651328230664709
3844609550582231725359408128481
1174502841027019385211055596446
229489549303819644288109756659
33446128475648233786783165271201
909145648566923460348610454326
6482133936072602491412737245870
066063155881748815209209628292
540917153643678925903600113305
305488204665213841469519415116
0943305727036575959195309218611
7381932611793105118548074462379
96274956735188575272489122793818
30119491

Pi Day Scavenger Hunt

Look around your school, home, library,
or online for these pi-themed things:

- ☐ **3** formulae using π
- ☐ **1** person credited with creating Pi Day
- ☐ **4** math problems with a solution equal to 3.14
- ☐ **1** US city with a zip code that contains “314”
- ☐ **5** mathematicians associated with pi
- ☐ **9** words beginning with “pi”
- ☐ **2** objects that measure 3.14 in length or weight
- ☐ **6** companies with circular logos
- ☐ **5** notable things that happened on 3/14
- ☐ **3** jokes, comics, or memes with a π symbol

Pi Day Bingo

Mark off each pi-related thing you see.
Try to get a bingo, π , or fill the whole card!

B I N G O

π symbol	22/7	ratio	Larry Shaw	
circum- ference	$\pi = \frac{C}{d}$		3.14	infinite
Albert Einstein	someone reciting pi	FREE SPACE	diameter	pi shirt
radius		pi pun	Leonhard Euler	Archimedes constant
pi art	irrational	March 14		$A = \pi r^2$

Pi Day Word Scramble

Unscramble the words below to reveal
the terms associated with pi.

1. mcaeldi _____
2. otrai _____
3. altianrori _____
4. raae _____
5. ilcrec _____
6. cerncuerfcemi _____
7. boslmy _____
8. smmtahciate _____
9. drasiu _____
10. ermotgey _____
11. teidrmea _____
12. itisgd _____
13. ttncsnoa _____
14. fnntieii _____
15. ordmna _____

“Pi” Word Challenge

Can you identify the words that begin with “pi?”

A tropical fruit with a spiky outer skin and sweet, juicy flesh.

A person who leads the way in exploration, innovation, or development.

A tube used for conveying liquids or gases.

The astrological sign representing fish.

A type of evergreen tree.

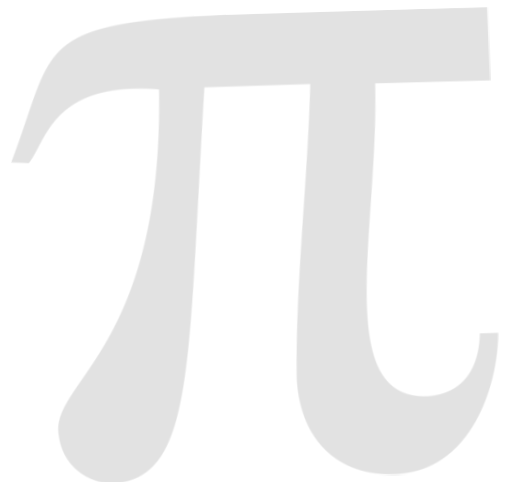
A person who robs or commits illegal violence at sea.

One who operates an aircraft in flight.

A liquid measurement equal to 1/8 gallon or 16 ounces.

Having religious devotion.

Spotted or patched, especially in black and white.



Pi-ku Haiku

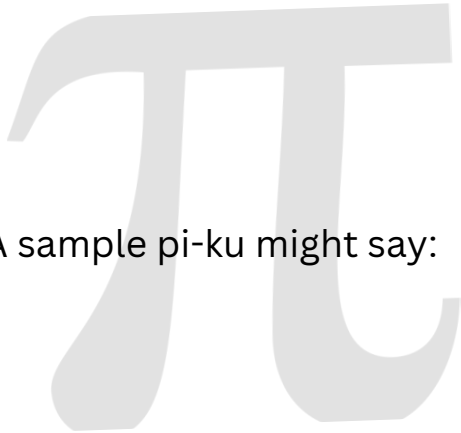
A **haiku** is a form of poetry that comes from Japan. Haikus are short, only three lines long, and contain 17 syllables total. In English, a haiku is often structured in the following way:

Line 1 - 5 syllables

Line 2 - 7 syllables

Line 3 - 5 syllables

A **pi-ku**, on the other hand, is a way to test your writing skills for Pi Day! A pi-ku is similar to a haiku, but instead of following the 5-7-5 syllable rule, each line of a pi-ku corresponds to the digits of pi (3.14).



Line 1 - 3 syllables

Line 2 - 1 syllables

Line 3 - 4 syllables

A sample pi-ku might say:

I love math.

Pi

is infinite.

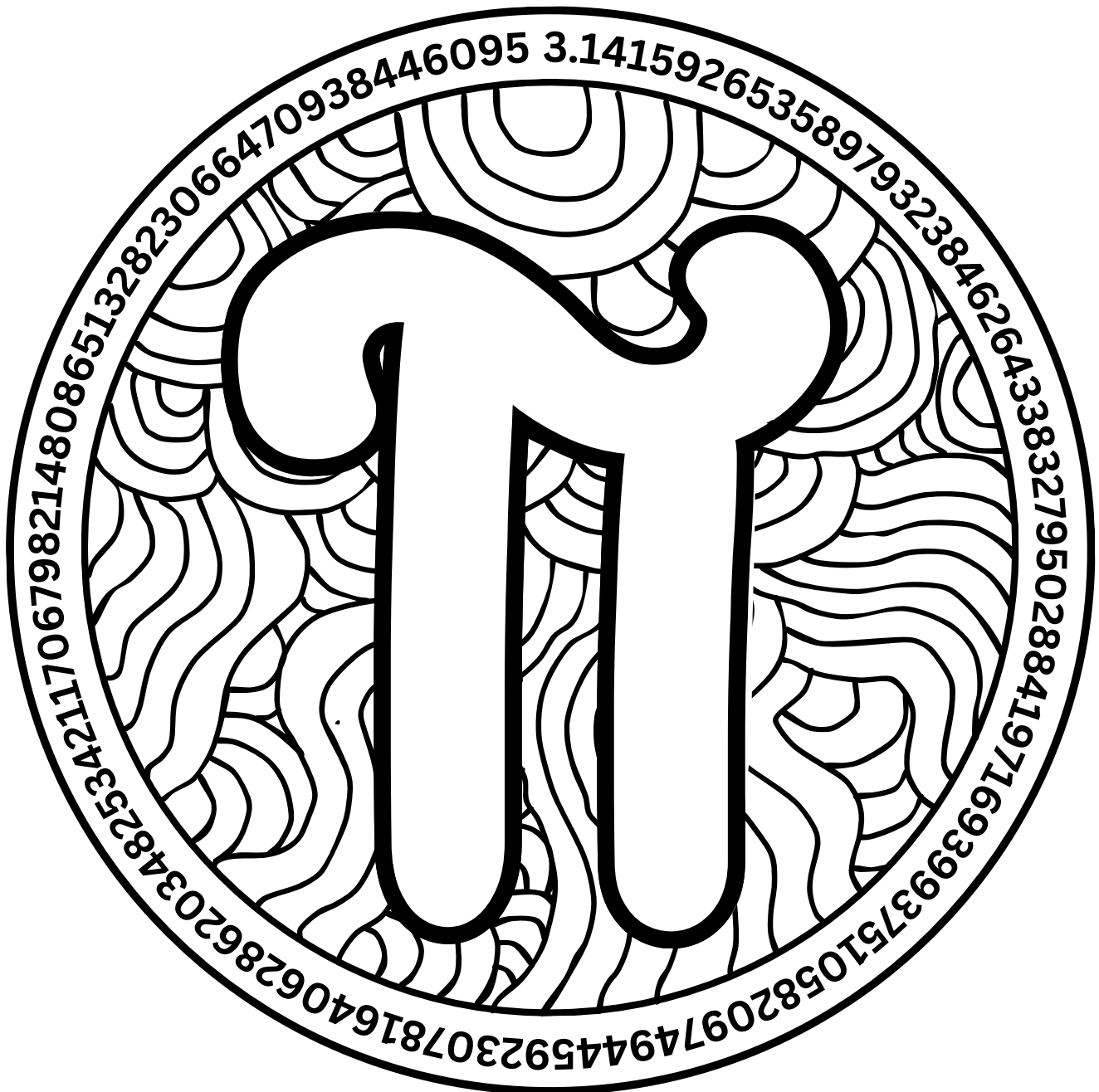
Write your own pi-ku in the space provided. Bonus points if you can make it math-related!

3 syllables

1 syllable

4 syllables

Happy Pi Day!



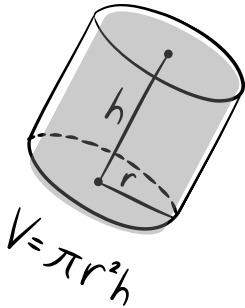
● ● ● **MENSA FOR KIDS** ● ● ●

π

Pi Day



$$V = \frac{4}{3} \pi r^3$$



$$V = \pi r^2 h$$

Palooza

Answer Key

π

Pi Day Word Scramble

Answer Key

1. decimal
2. ratio
3. irrational
4. area
5. circle
6. circumference
7. symbol
8. mathematics
9. radius
10. geometry
11. diameter
12. digits
13. constant
14. infinite
15. random

“Pi” Word Challenge

Answer Key

Pineapple

A tropical fruit with a spiky outer skin and sweet, juicy flesh.

Pioneer

A person who leads the way in exploration, innovation, or development.

Pipe

A tube used for conveying liquids or gases.

Pisces

The astrological sign representing fish.

Pine

A type of evergreen tree.

Pirate

A person who robs or commits illegal violence at sea.

Pilot

One who operates an aircraft in flight.

Pint

A liquid measurement equal to 1/8 gallon or 16 ounces.

Pious

Having religious devotion.

Piebald

Spotted or patched, especially in black and white.

