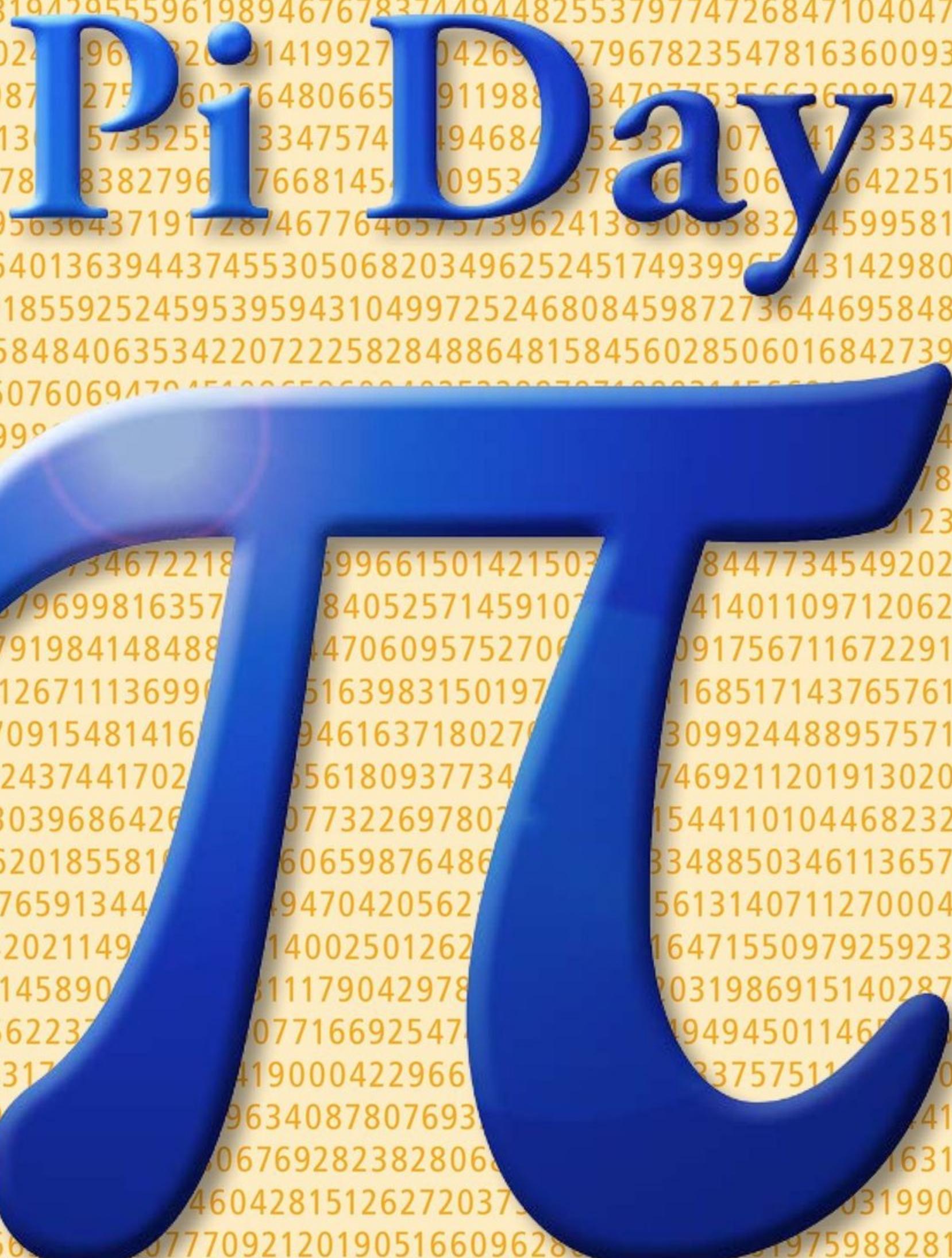


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Written by Nora Miller

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# Pi Day

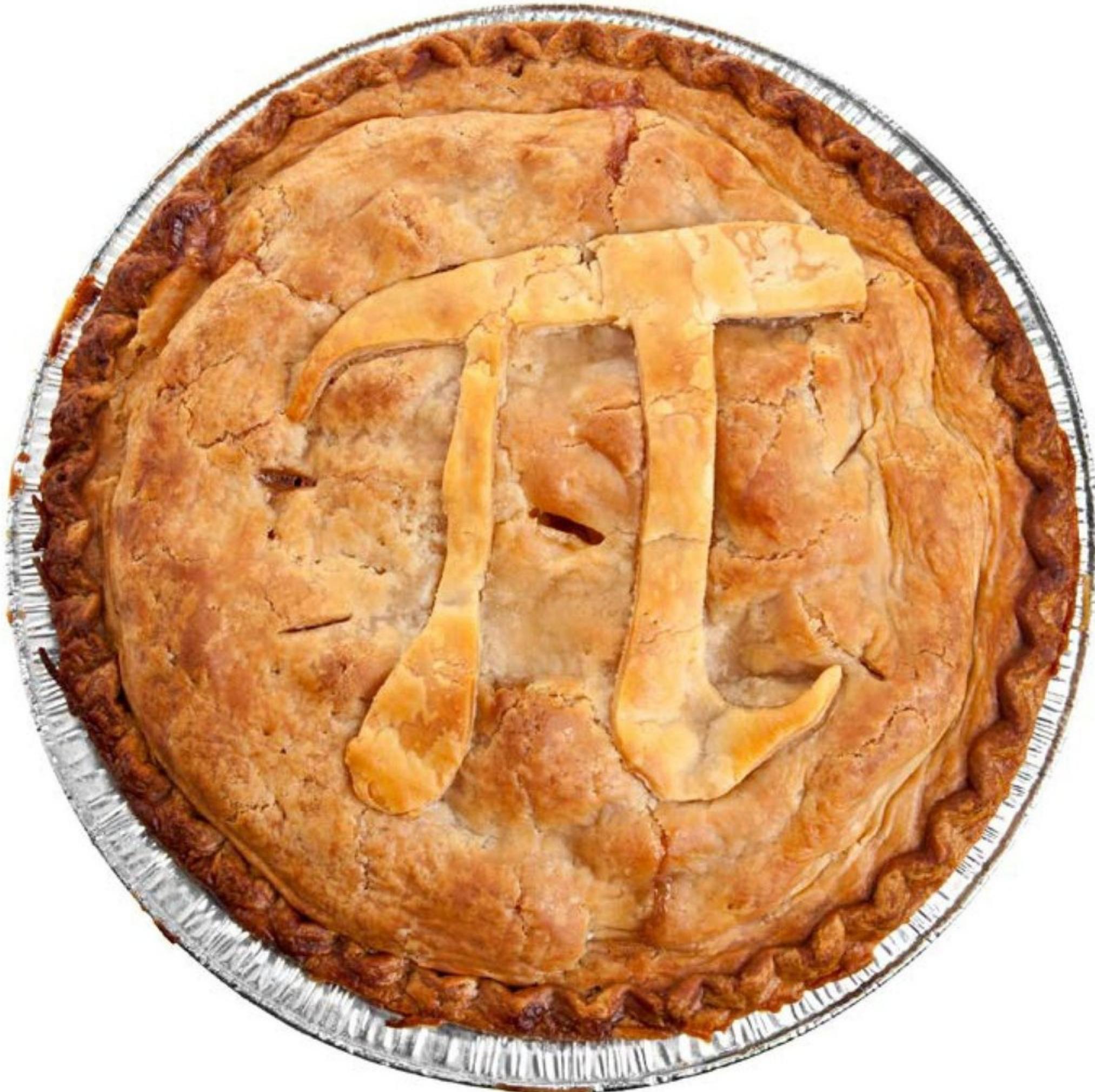


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## Introduction

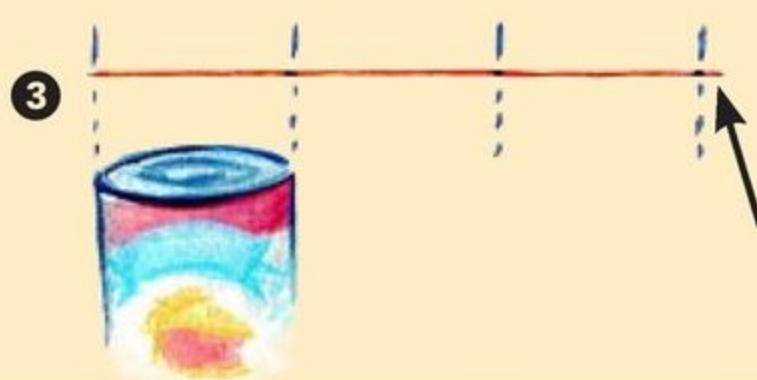
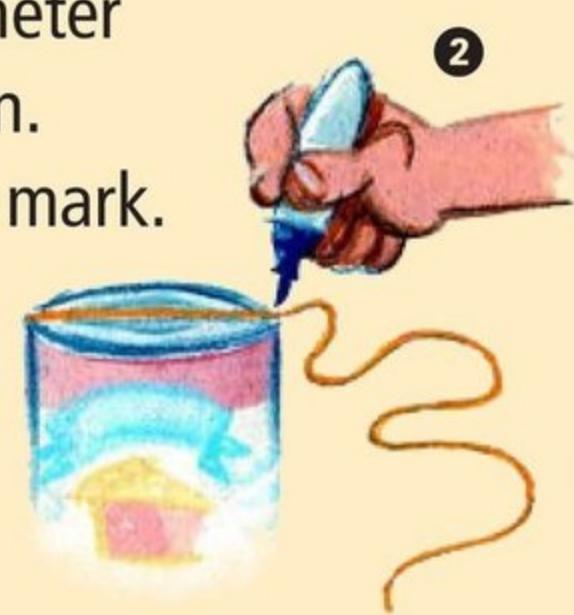
What's your favorite kind of pie? Apple? Pumpkin? Lemon cream? If you're a mathematician or someone who uses math in your work, it might be something very different. Pi sounds just like *pie*, but it's the name of a special number that allows people around the world to do many interesting things.

## What Is Pi?

The idea of pi was discovered more than two thousand years ago by a Greek mathematician named Archimedes (ark-uh-MEE-deez). He was experimenting with shapes and discovered something strange. He measured the length around a circle, called the **circumference**. Then he measured the distance across the circle from one side to the other through the middle, called the **diameter**. When he **divided** the circumference by the diameter, he got the same number every time. It didn't matter what size the circle was.

### Math Minute

To prove pi, take a soup can, a piece of string, and a marker or pen. ① Wrap the string around the outside of the can and cut it so the ends just touch. Then place the end of the string at the edge of the can and stretch it across. ② Mark the diameter where the string touches the other side of the can. Measure the diameter again, starting at the new mark. Keep doing that until you have three marks noting the diameter. ③ You will have a little bit left over after the third diameter mark. That's pi!



In 1706, a math teacher in England named William Jones was the first to call this special number pi. It is the name of the Greek letter  $\pi$ . Now all mathematicians and teachers use that symbol when they talk about pi.



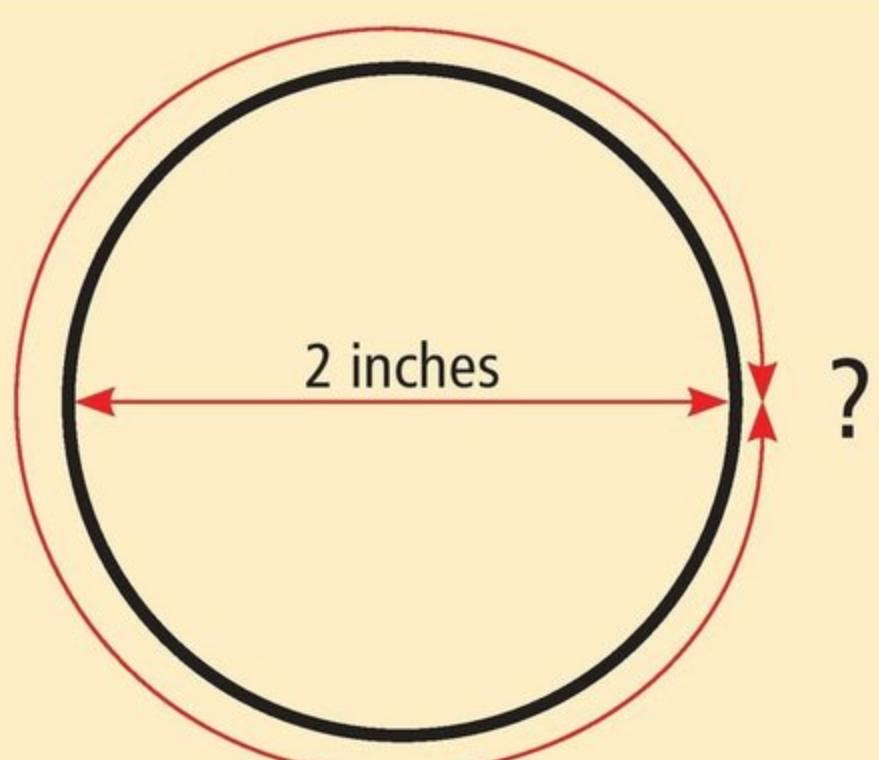
William Jones taught math on navy ships and in coffeehouses.

## Math Minute

Use pi (3.14) to find the circumference of a circle.

The formula is:  
 $\text{circumference} = \pi \times \text{diameter}$ .

If the diameter of a circle is 2 inches, what is its circumference?



Answer: 6.28 inches

The value of pi is often given as 3.14 (three point one four), but that is just an approximate value. The numbers to the right of the **decimal point** actually go on forever. No matter how you **calculate** it, there are more **digits** to find. In fact, computers have calculated pi to at least eight quadrillion digits to the right of the decimal point. If you tried to write down all those numbers of pi, you'd use enough paper to go around Earth over a million times! There would still be no end in sight!



This student wrote out pi to 1,120 places.



Agricultural sprinklers use long pipes on wheels to irrigate crops evenly.

What can we do with the number pi? It comes from the shape of a circle and has lots of uses. One use is to figure out the **area** of a circle. Area is the amount of space inside something that is flat. Landscapers use pi to figure out how much area a lawn sprinkler can cover. That amount tells them how many sprinklers they need in order to water a lawn evenly.

Pi can also be used to figure out the **volume** of something shaped like a ball or a tube. Volume is the amount of space inside something that is three-dimensional. Farmers use pi to discover the volume of grain that will fit in a silo for storage. That number helps farmers know if they have enough grain to feed their animals.



Pi also helps people do other kinds of math and science. Airline pilots use pi to figure out how much fuel they need to carry on their flights. Astronomers use pi to look for planets outside our solar system. They also use pi to determine what the universe looks like.

Galaxy Messier 81 was first discovered by Johann Elert Bode in 1774.



## Wowser!

The world record for memorizing pi is held by Chao Lu from China. Chao recited pi from memory to 67,890 places in November 2006. Marc Umile set a United States record in late 2006 by memorizing 12,887 digits of pi. The next year, he broke his own record by repeating 15,314 digits of pi.



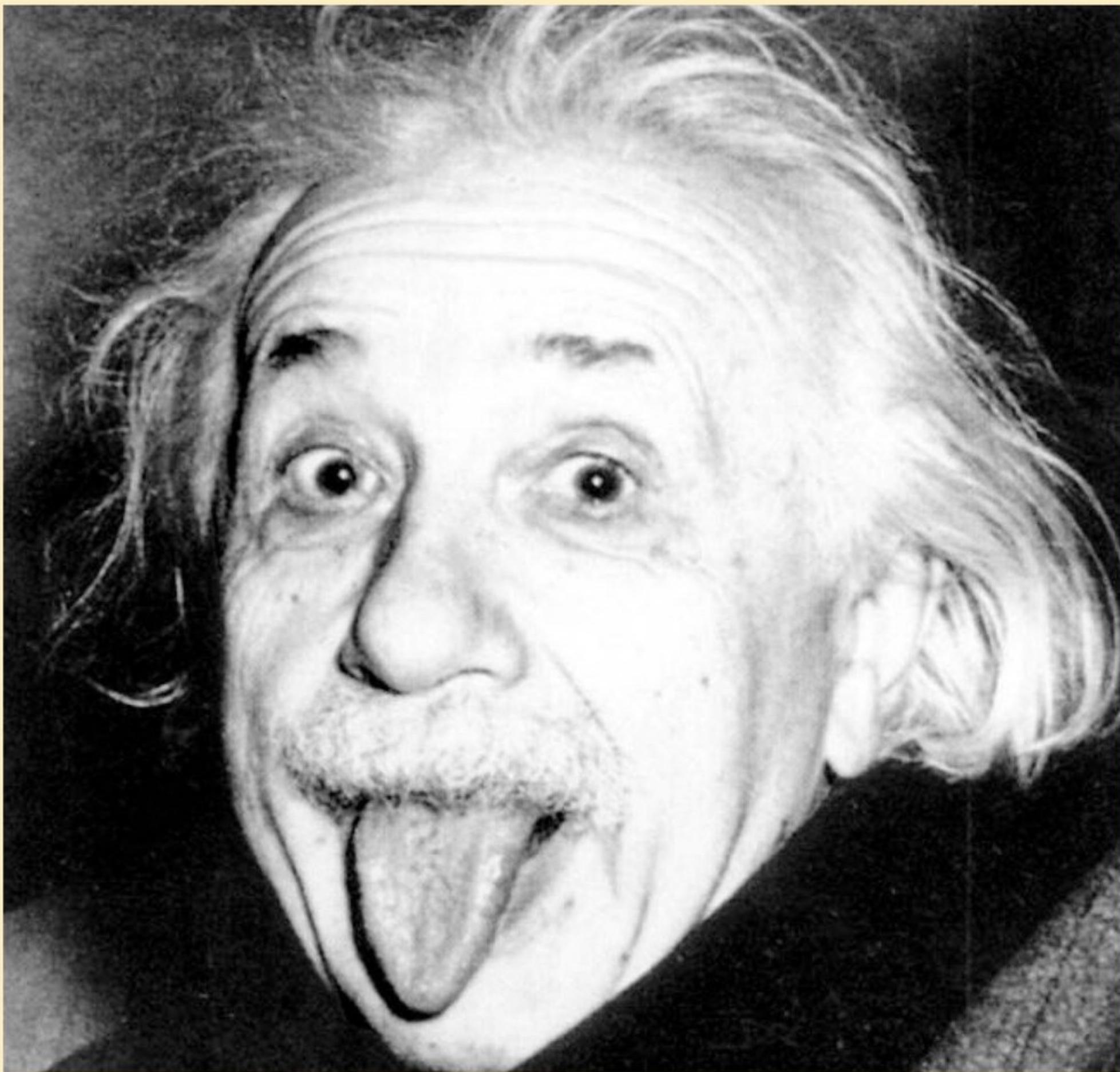
Chao Lu (left) receives his award for reciting pi.

Computers often need to generate random, or unpredictable, numbers. But computers can never create truly random numbers on their own. Instead, they use pi to help them come up with numbers that seem random to the user. Whenever you play a computer game that is partly based on luck, the computer is probably using pi to “roll the dice.”



## Do You Know?

Albert Einstein was born on March 14, 1879—Pi Day!



### A Day to Celebrate—Pi Day!

Mathematicians and other people around the world celebrate March 14 as Pi Day. They chose March 14 because of the way dates are written in the United States. The number for the month comes first, then the day, then the year. Since March is the third month, we can write March 14 as 3-14, the first three digits of pi!

Some people like to start their celebration of Pi Day at 1:59 PM and 26 seconds. This marks the first eight digits of pi—3.1415926! And once in each century, there's a special Pi Day—3-14-15. On that Pi Day, people can get “extra credit” for starting the celebration at 9:26 AM and 53 seconds. This time adds two more digits to the celebration string—3.141592653. Whew!

In 2009, the U.S. Congress voted to make March 14 National Pi Day. One representative who voted for it said he hoped students would “discover that they really do like math and they really do like science.”



In 2010, elementary school students in Florida made a pi chain with 5,904 links.

## How Do People Celebrate Pi Day?

The first Pi Day was celebrated in 1988. An American scientist named Larry Shaw arranged for a huge celebration at the San Francisco Exploratorium. People marched around a circular room, sang songs, and ate pie. News stories about the celebration spread the idea to schools, museums, and communities. Eventually, Pi Day events were held all over the world.



In 1988, Shaw led the parade, followed by people carrying the numbers of pi.

Many people celebrate Pi Day with family and friends. The most popular way to celebrate is by eating pi-themed foods. Many people make pizzas (round ones, of course) and bake fruit or cream pies. Some people even use a special pie pan shaped like the Greek letter  $\pi$ . Those who are willing to go one step further drink pi-neapple juice, too. If all that food is too sweet, there are always dinner foods such as shepherd's pie and chicken potpie.

After all that eating, some people work off their food by walking or running a pi marathon. These runs have distances of 3.14 miles (5.05 km) or 3.14 kilometers (1.95 mi.). Walking or running in a circle is also an option.

Other people celebrate by decorating their rooms or themselves with pi-themed objects. They cut out the shape of  $\pi$  and put it on walls and tables. Some people wear T-shirts with  $\pi$  on them or  $\pi$ -shaped jewelry.

Mathematicians celebrate the number pi because it is useful and important for many mathematical and scientific projects. The rest of us can celebrate Pi Day, too. It helps us remember that science can be fun as well as useful.



Some people like pi so much that they wear it.

## Glossary

<b>area</b> (n.)	the amount of space that could cover the surface of a shape or region as measured in square units (p. 8)
<b>calculate</b> (v.)	to work out or estimate an answer using mathematics (p. 7)
<b>circumference</b> (n.)	the distance around the outside of a circle (p. 5)
<b>decimal point</b> (n.)	the dot in a number such as 1.47 that indicates that the numbers to the right of it are tenths, hundredths, and so on (p. 7)
<b>diameter</b> (n.)	the length of a straight line drawn through the center of a circle or a sphere from one side to the other (p. 5)
<b>digits</b> (n.)	the numerals from 0 to 9 that can be used to write any number (p. 7)
<b>divided</b> (v.)	worked out a number by the process of division, in math; found how many times one number went into another number (p. 5)
<b>pi</b> (n.)	a constant value that represents the ratio between the circumference and diameter of a circle (p. 4)
<b>volume</b> (n.)	the amount of space that something takes up as measured in cubic units (p. 9)

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Title page: On Pi Day, some people compete in a pi-throwing event.

Page 3: Some students make themselves into pi on Pi Day.

Back cover: Sometimes people get a choice of pies to eat on Pi Day.

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