

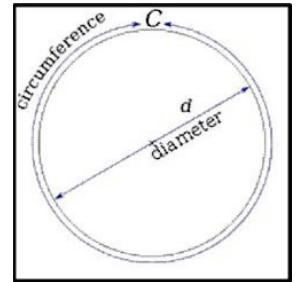
# Pi Day 2023

By John Walter

Pi Day is an annual celebration commemorating the mathematical constant, the ratio of a circle's circumference to its diameter, commonly stated as 3.14. It has been represented by the Greek letter  $\pi$  since the mid-18th century, though it is also sometimes spelled out as "pi". Pi Day is observed on March 14.

Being an irrational number,  $\pi$  cannot be expressed exactly as a common fraction, although the fraction  $22/7$  is commonly used. Consequently, its decimal representation never ends and never settles into a permanent repeating pattern. Also,  $\pi$  is a transcendental number - a number that is not the root of any non-zero polynomial having rational coefficients. This transcendence of  $\pi$  implies that it is impossible to solve the ancient challenge of squaring the circle with a compass and straightedge.

Although ancient civilizations needed the mathematical constant to be computed accurately for practical reasons, it was not calculated to more than seven digits in Chinese mathematics and to about five in Indian mathematics in the 5th century.



The circumference of a circle is slightly more than three times as long as its diameter. The exact ratio is called  $\pi$ .

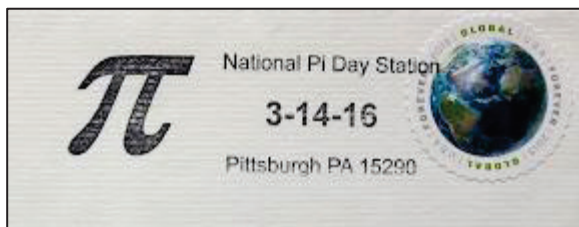


2013 Italian stamp honoring the 2300<sup>th</sup> anniversary of the birth of Archimedes showing  $\pi$  and math calculations.

The historically first exact formula based on infinite series, was not available until a millennium later, when in the 14th century the Madhava-Leibniz series was discovered in Indian mathematics.

In the 20th and 21st centuries, mathematicians and computer scientists discovered new approaches that, when combined with increasing computational power, extended the decimal representation of  $\pi$  to over 13.3 trillion ( $10^{13}$ ) digits. Scientific applications generally require no more than 40 digits, so the primary motivation for these computations is the human desire to break records. However, the extensive calculations involved have been used to test supercomputers and high-precision multiplication algorithms.

Because its definition relates to the circle,  $\pi$  is found in many formulae in trigonometry and geometry, especially those concerning circles, ellipses or spheres. It is also found in formulae used in other branches of science such as cosmology, number theory, statistics, fractals, thermodynamics, mechanics, and electromagnetism. The ubiquity of  $\pi$  makes it one of the most widely known mathematical constants both inside and outside the scientific community. Several books devoted to it have been published, the number is celebrated on Pi Day and record-setting calculations of the digits of  $\pi$  often result in news headlines. Attempts to memorize the value of  $\pi$  with increasing precision have led to records of over 67,000 digits.



Special postmark on Pi Day 2016 in Pittsburg, PA with USPS Global forever stamp.



A First Day Cover from Portugal for a Pi Day stamp issued March 14, 2012.

Pi Approximation Day is observed on July 22 (22/7 in the day/month format), since the fraction is a common approximation of  $\pi$ . Since that is my birthdate, I naturally found this subject very interesting.

There are many examples of personal Pi Day stamps on the Zazzle.com website.



The stamp inscription reads:  
LOVE is like  $\pi$   
NATURAL • IRRATIONAL • IMPORTANT



John Walter is the editor of the Post Boy and webmaster. He collects Japan, used U.S. postal stationery including aerograms.