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What is Pi?

By Elaine J. Hom, LiveScience Contributor | April 30, 2013 06:12pm ET

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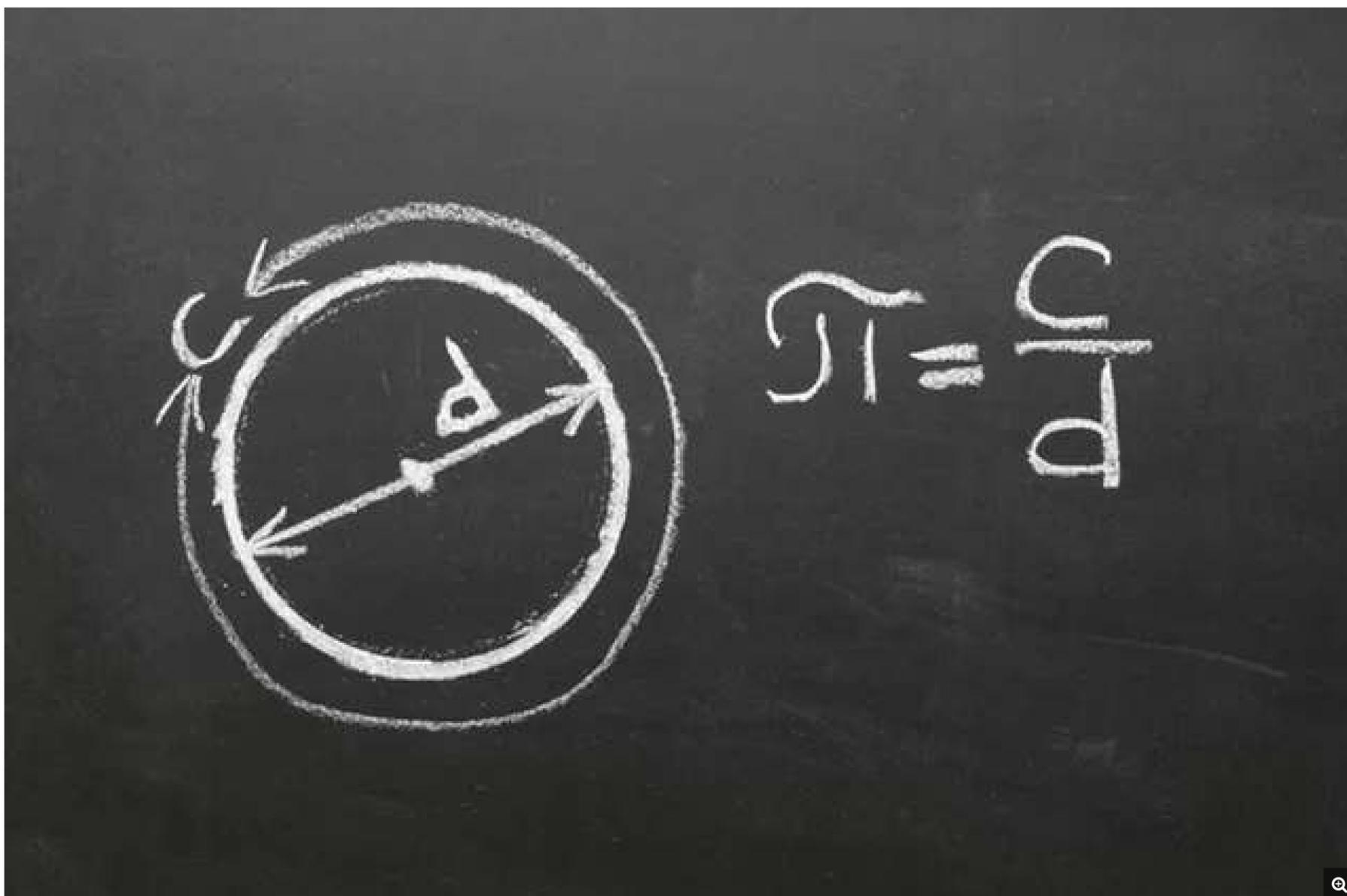
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Pi equals the circumference divided by the diameter of a circle.

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Pi (π), the 16th letter of the Greek alphabet, is used to represent the most widely known mathematical constant. By definition, pi is the ratio of the circumference of a circle to its diameter. In other words, pi equals the circumference divided by the diameter ($\pi = c/d$). Conversely, the circumference is equal to pi times the diameter ($c = \pi d$). No matter how large or small a circle is, pi will always work out to be the same number.

Pi is an irrational number, which means that it is a real number with nonrepeating decimal expansion. It cannot be represented by an integer ratio and goes on forever, otherwise known as an infinite decimal. There is no exact value, seeing as the number does not end. Many mathematicians and math fans are interested in calculating pi to as many digits as possible. The Guinness World Record for reciting the most digits of pi belongs to Lu Chao of China, who has recited pi to more than 67,000 decimal places. [The Pi-Search Page website](#) has calculated it (with the help of a computer program) to 200 million digits.

Value of pi



The website [I Like Pi](#) has the first 10,000 digits listed.

History of pi

Pi has been known for nearly 4,000 years and was discovered by ancient Babylonians. A tablet from somewhere between 1900-1680 B.C. found pi to be 3.125. The ancient Egyptians were making similar discoveries, as evidenced by the Rhind Papyrus of 1650 B.C. In this document, the Egyptians calculated the area of a circle by a formula giving pi an approximate value of 3.1605. There is even a biblical verse where it appears pi was approximated:

And he made a molten sea, ten cubits from the one brim to the other: it was round all about, and his height was five cubits: and a line of thirty cubits did compass it about. — 1 Kings 7:23 (King James Version)

The first calculation of pi was carried out by Archimedes of Syracuse (287-212 B.C.). One of the greatest mathematicians of the world, Archimedes used the Pythagorean Theorem to find the areas of two polygons. Archimedes approximated the area of a circle based on the area of a regular polygon inscribed within the circle and the area of a regular polygon within which the circle was circumscribed. The polygons, as Archimedes mapped them, gave the upper and lower bounds for the area of a circle, and he approximated that pi is between $3 \frac{1}{7}$ and $3 \frac{10}{71}$.

Zu Chongzi of China (429-501) calculated pi to be $\frac{355}{113}$, though how he arrived at this number is a mystery, as his work was lost. Pi began being symbolized by the pi symbol (π) in the 1706 by the British mathematician William Jones. Jones used 3.14159 as the calculation for pi.

Pi r squared

In basic mathematics, pi is used to find area and circumference of a circle. Pi is used to find area by multiplying the radius squared times pi, or. So in trying to find the area of a circle with a radius of 3 centimeters, $\pi 3^2 = 28.27$ cm. Because circles are naturally occurring in nature, and are often used in other mathematical equations, pi is all around us and is constantly being used.

Pi has even trickled into the literary world. Pilish is a dialect of English in which the numbers of letters in successive words follow the digits of pi. Here's an example from "Not A Wake," by Mike Keith, the first book ever written completely in Pilish.

*Now I fall, a tired suburban in liquid under the trees,
Drifting alongside forests simmering red in the twilight over Europe.*

Now has 3 letters, I has 1 letter, fall has 4 letters, a has 1 letter, and so on, and so forth.



Pi is the 16th letter of the Greek alphabet.

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