

Name _____



History of Pi

By Sharon Fabian

To find the area of a circle, you multiply pi times the radius of the circle squared. To find the circumference of a circle, you multiply pi times the circle's diameter. Pi is a useful number, but before we could use it, someone had to figure out that there was such a thing as pi.



Pi is the ratio of the circumference to the diameter of a circle. It is the same number for every circle. The digits for the number pi begin 3.1415926535 and continue without ever ending or repeating. We often use a shorter estimation for pi, such as 3.14.

In ancient times, people in China, Babylon, and Egypt used pi. Even the Bible mentions circle calculations that are based on the number pi. In those times people were not using decimals yet, so they used either the whole number 3 or fractions for pi.

Archimedes was one of the first mathematicians to try to calculate pi as closely as possible. Archimedes was a great scholar who lived from 287 to 212 BC. He calculated circles by inscribing them inside of polygons. He may have started with a 6-sided polygon. Then he drew a circle inside the polygon, with its sides touching the polygon. Next, he drew a second 6-sided polygon inside the circle with its corners touching the circle. Since polygons had straight sides, there were already formulas available for finding the area of the polygons. The area of the circle would be between the areas of the two polygons. He continued to measure circles more and more precisely by using polygons with more and more sides. Since he had to do all of his work with fractions, not decimals, this was a very time consuming task. Using his circle calculations, Archimedes eventually determined that pi was between $\frac{223}{71}$ and $\frac{22}{7}$. In decimals, this would be approximately 3.14.

After Archimedes, many other mathematicians tried to calculate pi even more precisely. In the 1600s when decimals came into use in Europe, calculations became just a little easier. One mathematician named Ludolph Van Ceulen spent most of his life calculating pi to 35 decimal places. The number

3.1415926535897932384626433832795028 is carved on his tombstone.

At first, mathematicians were hoping either to find the end of the number pi, or to find where the digits started to repeat. They never found either one. Each new calculation of pi only added more and more digits, but in no repeating pattern. Finally in 1768, Johann Lambert proved that pi will never end or repeat. It is an irrational number. Pi can also be called an infinite decimal.

The calculation of pi had taken another step forward with the invention of calculus. Ever since the late 1600s, mathematicians had been using calculus to create new and better formulas for pi. An Indian mathematician named Srinivasa Ramanujan wrote a new formula in 1910 that would later be used by computers to calculate pi to millions of decimal places.

In September 1949, an early ENIAC computer began a calculation of pi. The job took 70 hours, but when it was done, pi had been computed to 2,037 decimal places.

Faster and faster computer programs have continued to extend the number of known digits of pi. Pi was calculated to millions of places and then to billions.

Luckily, you won't need to use a number that exact to do your calculations in geometry class. In most cases, 3.14 will work just fine.

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Questions

- _____ 1. Pi is _____.
- A. the ratio of the circumference to the diameter of a circle
 - B. another word for diameter
 - C. another word for circumference
 - D. none of the above
- _____ 2. Pi has been known about since _____.
- A. 1910
 - B. the 1600s
 - C. ancient times
 - D. none of the above

