SETSCI Conference Indexing System, Volume 3 (2018), 554-555

ISAS 2018-Winter

2nd International Symposium on Innovative Approaches in Scientific Studies

November 30 – December 2, 2018, Samsun, Turkey

A Note on the Limit of Pi (π) Number

Şaban Yılmaz[1*+]

[1]Department of Computer Technologies / Turhal Meslek Yüksekokulu, Gaziosmanpaşa University, Tokat, Turkey
*Corresponding author: saban.yilmaz@gop.edu.tr
+Speaker: saban.yilmaz@gop.edu.tr
Presentation/Paper Type: Oral / Full Paper

Abstract **–** Throughout history, many studies have been done about the number of pi (π), which is the anchor part of the circumference of the circle. Some of them even went forward and appointed a blessing to the pi (π) number or even trying to give various secrecy. Nowadays; people from the date of birth to the number of people in the population reported that they include every number and even prepared internet sites. However, there are almost every irrational number of cases. So almost every irrational number contains numbers of this type. The most important reason for attributing sanctity to the number of pi (π) is that much academic work is done on it. The history of pi (π) is known as BC. It goes back to 2550. But it was the first time that John Wallis (1616-1703, England) identified the number without error, and later, many pi (π) numbers were found. Rational numbers, such as the ladder method, limit, serial, integral using the concepts such as the number of pi (π) studies have been done. Their number is around two hundred. In this study, we have obtained four equations that find pi (π) number.

Keywords **–** *Pi (π) number, degree, grad, trigonometry, limit.*

I. Introduction

The ratio of the circumference of a circle to its diameter gives the number Pi (π). This number, which we briefly processed as 3.14, has noticed the shape of the circle, even before the invention of the wheel, and has attracted attention for many years since it is an interest between its diameter and its surroundings.

The first study on the number of pi (π) in history BC It is known to be between 2550 years. [1] In 1858, Alexander Henry Rhind, a Scottish man, discovered the paper called the Rhind Papyrus in Egypt, and it was found that he was taken as an $\pi = \frac{256}{81} = 3{,}1605$ on the paper. [2]

According to the information taken from the ancient texts, Babylonians BC. In the year 1900, the number of pi (π) was $\pi = \frac{25}{8} = 3{,}125$. [1]

Archimedes (Archimedes) (287-212 BC) is considered the first person to calculate the pi value with an accurate estimate. He did this by finding the fields of the two polygons. Although Archimedes could not calculate the exact value of the pi, he found a very close value. He used a polygon of 96 edges to obtain a value between 3.1408 and 3.14285. [2] This showed that the value is between $\frac{22}{7} = 3 + \frac{1}{7}$ and $\frac{216}{71} = 3 + \frac{10}{7}$. [2]

A.D. For the year Pi around 3,1415929 was used. In later periods, Ptolemy (M.S. 100-160, Egypt) $\frac{377}{120}$, Fibonacci (1170-1250, Italy) 3,141818, Lazzarini (1657-1730, Italy), 1415929 used as. [1]

In the Greek alphabet, the 13th letter pi was first used by Leonhard Euler with the pi symbol. He named it Pi. But this number is also known as the "Archimedes constant Ama and" Ludolph number imet. [1]

Wallis (1616 -1703, England) found the

$$\frac{\pi^4}{2} = \left(\frac{2.4.6.8...2n}{1.3.5.7...(2n-1)}\right)^2, \ (n = 1,2,3,\ldots)$$

equation showing the pi number. [3]

Gregory (1638 -1676) revealed the

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \ldots$$

serini for pi number. [1]

π = 3.141592653589793238462643383279502884197169 ov format of the number Fabrice Bellard, in 2010, using the Chudnovsky algorithm, the first 2.699.999.990.000 digits of the number found. [1]

In this study a new method will be used to obtain pi (π) number.

II. Materials and Method

Circle, smooth n-gene, trigonometric concepts used in this study are not known here because they are known by everyone.

Theorem: $n \in \mathbb{N}$;

a) $\lim_{n\to\infty} n\sin\frac{180}{n} = \pi$

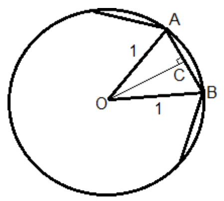
b) $\lim_{n\to\infty} n\tan\frac{180}{n} = \pi$

c) $\lim_{n\to\infty} n\cos\frac{90(n-2)}{n} = \pi$

d) $\lim_{n\to\infty} n\cot\frac{90(n-2)}{n} = \pi$

format.

Proof: Let's draw a uniform n-gene for the circle whose radius is 1 unit.



Since L is an internal angle $\frac{(n-2)180}{n}$ of the regular polygon is

$$m(OAB) = \frac{(n-2)180}{2n} = \frac{(n-2)90}{n}.$$

That's

$$m(OBA) = \frac{(n-2)90}{n},\ m(AOC) = 180 - \frac{2.(n-2)90}{n} = \frac{180}{n}.$$

It's $|AC| = |CB| = \sin\frac{180}{n}$. The circumference of the polygon is $2n\sin\frac{180}{n}$ units. Circle becomes $n \to \infty$ when taken in the polygon.

Since the number of pi (π) is the ratio of the circumference of the circle to the radius of the circle,

$$\lim_{n\to\infty}\frac{2n}{2}\sin\frac{180}{n} = \lim_{n\to\infty} n\sin\frac{180}{n} = \pi$$

is located. //

By using the n-gene drawn around the circle, b is shown by a similar method. C and d are also shown because

$$\frac{(n-2)90}{n} + \frac{180}{n} = 90 \text{ is.}$$

A second proof of this theorem:

$$\lim_{x\to 0}\frac{\sin x}{x} = 1$$

is known. It is easily seen that

$$\lim_{n\to\infty}\frac{\sin\frac{\pi}{n}}{\frac{\pi}{n}} = 1$$

$$\lim_{n\to\infty} n\sin\frac{\pi}{n} = \pi$$

is to be taken for this equation.

Example: Let's take $n = 1\,000\,000\,000$ specifically.

$$1\,000\,000\,000\sin\frac{180}{1\,000\,000\,000}$$

$$= 3{,}1415926535897932332949306$$

III. Results

The number of pi (π) that people have studied for centuries has been done by hundreds of methods. In this study, the different methods of pi (π) were investigated and 4 different methods were developed.

References

[1] http://www.ilkkimbuldu.com/pi-sayisi
[2] http://www.ibrahimay.net/bilim/ahmes-misir-mo-1680-mo-1620-ve-rhind-papirusu
[3] https://onedio.com/haber/3-14-pi-gununde-pi-sayisi-hakkinda-bilmeniz-gereken-16-sey-268718