

## TRIGONOMETRY

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ABSTRACT	KEY WORDS
This article will talk about what scientific research scientists have done in ancient times in the formation of trigonometry.	Trigonometry, triangle, diameter, segment, sine, cosine, radian.

### Introduction

The term "trigonometry “is derived from the Greek words” trigonon “ — triangle and” metrio “ — measure, and together means” Triangle measurement".

The demand for measuring angles has emerged from a very long time, as has the need to measure distances. One of the development factors of trigonometry came from the need to determine the timing, the position of a ship in the high seas or a caravan in the desert.

Having studied the connection between the sides and corners of the Triangle, ancient people found ways to calculate various elements of the Triangle.

Ancient Vavilon scientists had some knowledge of trigonometry. This is evidenced by the fact that the vavilonians know about solar and lunar eclipses. In one of the clay tables of ancient Vavilon (2 thousand years ago BC), an issue is solved: in it, according to the known diameter of the circle and the height of the segment, the length of the vatar is calculated, which corresponds to the establishment of a connection between the sine and the cosine.

Ancient Greek scholars knew the methods of solving right-angled triangles. The astronomer and mathematician Hipparchus (until 2nd century AD) compiled a table of vatars — the first trigonometric tables.

One of the great successes in the construction of trigonometric tables is K.Rolemey's (2nd century) “Almagest” became a work. The work collects and summarizes various data from astronomy and related sciences known at the time. Here is a table of vatars compiled in the hexadecimal count system, with a half-degree interval from 0 to 180°. In fact, the vatars table is the table of Sines from 0 to 90 degrees itself. Ptolemy also gives rise to formulas that appear in modern designations as follows.

It was used to determine distances to inaccessible places, primarily to address practical astronomy issues.

Trigonometry was developed after him by scientists from India, the middle and Middle East. They introduced sine, cosine, tangent, cotangens, based on the radian measure of the angle.

Trigonometry is a branch of mathematics that deals with the relationship between the angles and sides of triangles. It focuses on the study of trigonometric functions, which are the ratios of the sides of the right triangle.

The primary trigonometric functions are: sine (sin), cosine (cos), and tangent (tan). These functions connect the angles of the right triangle with the proportions of its sides. The sine function represents the ratio of the length of the side opposite the angle to the length of the hypotenuse. The cosine function represents the ratio of the length of the adjacent side to the angle to the length of the hypotenuse. The tangent function represents the ratio of the length of the side opposite the angle to the length of the side adjacent to that angle.

Trigonometry is used in various fields such as physics, engineering, architecture, computer graphics. It plays a very important role in calculating distances, heights, trajectories and angles in Real-world applications. Trigonometric identities, equations, and formulas are used to solve problems with triangles, circles, and periodic phenomena.

Some key concepts and topics in trigonometry include unit circle, radian measure, trigonometric identities (e.g. Pythagorean identity and dual-angle identity), inverse trigonometric functions, sine and cosine laws.

A fixed notion of trigonometry is necessary for more modern mathematical concepts such as calculus and complex numbers.

Trigonometric functions are one of the important classes of functions. It is distinguished from the main problems of the theory of trigonometric functions. Some important results of the theory of trigonometric functions: 1. For a finite function  $f(x)$  on a dimensional and almost prime Earth, there are trigonometric functions  $g_n(x)$  that converge to  $f(x)$  almost everywhere. 2. The Fourier series of integrable functions that move away from the Hamma Earth  $g_n(x)$  exist. 3. For each dimensional function  $f(x)$ , the trigonometric functions approximating  $f(x)$  by Measure  $g_n(x)$  exist. Trigonometric functions have wide applications in number theory ("method of trigonometric sums") and in mathematical physics equations ("Fourier method"). Trigonometric functions were first defined by L. Found in 5mler cases. After the introduction of Lebeg intephaly, the current rigorous theory of trigonometric functions was created.

Trigonometric identities are relevant for all values corresponding to the angle  $\alpha$  of trigonometric equality, that is, the basic branch of trigonometry, where the left and right part have equal meanings.

Equalities that are appropriate for all possible values of the letters included in it, that is, those that are correct for all values of its left and right parts that make sense, are called equalities, issues related to the proof of such equalities are called questions related to the proof of identities. In today's lesson, we will learn to prove trigonometric identities. There are 4 main ways to prove trigonometric identities:

Method 1. To show that in the left part of the mirror the mirror form is equal to the right part of it, performing substitutions.

Method 2. In the right part of the mirror, the mirror figure performs substitutions to show that it is equal to the left part.

Method 3. To show that the subtraction of the left and right parts of the mirror is zero.

Method 4. To make changes of the same shape in the left and right parts of the mirror and to express them the same.

The law of berunius is given in the work " the table of Sines with an interval of 15 minutes, the table of tangents with an interval of  $1^\circ$  with an accuracy of up to  $10^{-8}$ . In this case, the table of Sines is given with an interval of 1 minute, the table of tangents is given with an interval of 1 minute from  $0^\circ$  to  $45^\circ$ , and the interval from  $46^\circ$  to  $90^\circ$  is given with an accuracy of up to 5 minutes bi lan  $10^{-10}$ . Ghiyosiddin Jamshid Al-Koshiy „in his ri sola on Watar and sinus, calculates  $\sin 1^\circ$  after commas at 17 room resolution:

$$\sin 1^\circ = 0,017452406437283512...$$

In the course of geometry, the sine, cosine, and of the angle represented by the degree tangency is included. The sine and cosine of an arbitrary angle are defined as:  $\alpha$  is said to be the sine of an angle  $(1;0)$  to the ordinate of the point formed by tilting the point to an  $\alpha$  angle around the head of coordinates, and is defined in sina style.

the cosine of angle  $\alpha$  is said to be the abscissa of the point formed by tilting the point  $(0;1)$  to angle  $\alpha$  around the head of coordinates is cosa-style defined.

$\alpha$  is said to be the tangent of the angle  $\alpha$  to the ratio of the sine of the angle to its cosine, and is defined as tga.

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