

General Concepts about Trigonometry

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Abstract:

this article will talk about what scientific research scientists have done in ancient times in the formation of trigonometry. One of the larger sections of algebra is a brief overview of the concept of angles, which is the initial part of the trigonometry section.

Keywords: *trigonometry, triangle, diameter, segment, sine, cosine, radian.*

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°.

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.

The outstanding child of the Uzbek people, the famous sociologist Berunius, spent his whole life on the path of the development of Science and culture, despite the suffering and various difficulties of the Middle Ages. Berunius filled the treasure of Science with such priceless jewels that all mankind is infinitely proud of this.

Notable in evaluating Berunius mathematical work is his work "law Mas'udi", especially his third paper on trigonometry.

Among the scientists who have left a name in the history of World Science and culture with their very rich creations, there are many representatives of the Uzbek people, among whom Ulugbek and representatives of his scientific school occupy a special place.

The ulughbek school employed prominent scholars such as Rumi, Ghiyosiddin Jamshid-al-Koshy and Ali Qushchi in Kazizo, and later Hasan Chalabi, Muhiddin al-Koshy, Mansur al-Koshy and other scholars in this academy.

The largest of the scientific studies achieved at the Ulugbek school is a scientific work belonging to the Ulugbek pen "new astronomical tables", dedicated to the movement of stars and planets. The work is known by the names "Ulugbek ziji" or "Ziji Koragani". ("Zij "is derived from the Persian word" Zik", and it means" Table".) The "ulughbekziji" was first written in aforstile, which was then translated into Arabic by Ghiyosiddin Jamshid al-Koshiy.

The "Ulugbek ziji" introduction, that is, the theoretical part, consists of tables compiled on the basis of observations made in the Observatory.

The first book of the " Zij " dealt with theoretical and practical issues of astronomy, chronicling issues related to the compilation of a calendar (Calendar), the dates of Arabs, Greeks, Iran, China and Uyghur, the relationship of periods, years and months, the movement of The Sun and Moon. So, this book is one of the three main quantities, the problem of measuring time, scientifically solved.

The second book of " Zij " is devoted to mathematics and spherical astronomy. The third book is devoted to trigonometric tables. They were calculated in the accuracy of ten decimal rooms. This is considered a huge accuracy for the 15th century. In the part of the third book that concerns Applied Astronomy, issues such as the inclination of the ecliptic to the equator, the determination of the coordinates of the celestial luminaries, the determination of the distances between stars and planets are considered.

The first paper consisted of 10 chapters, and in Chapter 1, the issues of calculating the sides of a regular triangle and Decagon drawn internally by making watars were solved. Chapter 2 gives theorems representing the sine of the sum and subtraction of two angles, the hesitant and the half-angle sine. Chapter 3 deals with the question of making the side of a regular internally drawn Polygon, solved by solving third-order equations and using a special computational process. Chapter 4 is a question of dividing the angle by an equal three, and describes 12 different methods given by some mathematicians since Archimedes ' time to solve this problem. Based on the results of the past chapters in Chapter 5, the ratio of the length of the circle to the diameter is calculated. This value is $\pi \approx 3,1417...$ is equivalent to. Chapter 6 gives a table of Sines. Chapter 7 provides rules for using the same table of Sines. Chapter 8, on the other hand, gives a table of tangents and its use, a proof of the theorem of Sines in plane trigonometry. Chapters 9-10 are devoted to spherical trigonometry.

By the 10th century, Islamic mathematicians were using all six trigonometric functions, tabulating their values and applying them to problems of spherical geometry. The Persian scientist Nasiriddin at-Tusi has been described as the creator of trigonometry as a kind of mathematical science. He was the first to consider trigonometry as a mathematical science independent of astronomy, bringing spherical trigonometry to its current form. In spherical trigonometry, he enumerated the six exact

States of a right triangle, and in his work “on the sector picture”, he outlined the law of Sines for plane and spherical triangles, opened the law of tangents for spherical triangles, and gave proofs to both. Knowledge of trigonometric functions and methods reached Western Europe through Latin translations of Ptolemy's Greek work "Almagest", as well as works by Persian and arab astronomers such as Al Battani and Nazarene at-Tusi. One of the earliest northern European works on trigonometry in mathematics was "de Triangulis" by the 15th-century German mathematician Regiomontanus. Meanwhile, another translation of Almagest from Greek into Latin was completed by Trebizond. Trigonometry was still little known in northern Europe in the 16th century.

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