THE SCIENTIFIC LEGACY OF ORIENTAL SCHOLARS IN THE DEVELOPMENT OF MATHEMATICAL SCIENCE

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Abstract: A student who is good at math will have a high level of analytical and logical thinking. It develops the ability to make quick decisions, discuss and negotiate, and do things step by step, not only in solving examples and problems but also in different situations in life.

Key words: Mathematics, development, calculations, formulas, integral calculus, numbers.

Introduction

Because the first object was a number, it was often referred to as the "science of arithmetic" (in today's mathematics calculations, even operations on formulas, play a very small role). Mathematics is one of the oldest sciences, with a long history of development, and at the same time, "What is mathematics?" The answer to this question has also changed and deepened. In Greece, mathematics was understood as geometry. In the IX-XIII centuries, the concept of mathematics was expanded by algebra and trigonometry. After analytical geometry, differential, and integral calculus became central to mathematics in the 17th and 18th centuries, it was defined as "the science of quantitative relations and spatial forms" until the early twentieth century. In the late 19th and early 20th centuries, objects of various geometries (such as Lobachevsky geometry, projective geometry, Riemannian geometry), algebras (such as Bull's algebra, quaternion algebra, Kelly's algebra), and infinite-dimensional spaces were very diverse in content, often artificial objects. and the above definition of mathematics is too narrow.

During this period, as a result of the formation of a unique style and language of observation based on mathematical logic and set theory, the idea that the most important feature in mathematics is strict logical observation (J. Peano, G. Frege, B. Russell, D. Hilbert). In the mid-20th century, a group of French mathematicians who revised the definition of mathematics under the pseudonym Burbaki developed the idea, defining it as "Mathematics is the science of mathematical structures." Although this approach was broader and more precise than previous definitions, it was still limited - relationships between structures (eg, mathematics, series theory, algebraic topology), applied and applied theories, and mathematical models in physics, engineering, and social sciences did not fit into this definition. In the last century, there has been a very deep relationship between the various mathematical objects, and the results based on this show that they will play a key role in the further development of mathematics. Along with electronic computing, the expansion of the application of mathematics (biometrics, sociometry, econometrics, psychometry, etc.) and the rapid penetration of mathematical methods into various spheres of life have expanded the subject of mathematics beyond comprehension. Thus, mathematics is a science that studies axiomatic theories and mathematical models, the relationships between them, and draws conclusions based on rigorous logical observations. Thematic knowledge, which originally began with simple numbers and the arithmetic operations on them, has expanded and deepened along with universal progress. Even in the earliest written sources (e.g., mathematical papyrus) there are examples of operations on kayers and the solution of linear equations. Irrigated agriculture, the development of architecture, and the increasing importance of astronomical observations led to the accumulation of evidence for geometry.

For example, in ancient Egypt, a triangle with sides of 3, 4, and 5 units was used to be a right angle. The greatest achievements of the mathematics of this

period can be seen in the example of the rule for calculating the volume of a regular rectangular truncated pyramid (in the present case, V— (a2 + ab + b2) corresponds to the formula L / 3) and the approximate value of l = (16/9) 2.

In Greece, it was discovered that geometric properties could be found not only through observation and experiment, but also from known properties, and the idea of deductive proof was developed (Fales, Pythagoras, etc.). The culmination of this idea was the axiomatic construction of geometry in Euclid's Fundamentals. This book had a great influence on the further development of mathematics and was a model for the perfection of logical expression until the beginning of the 19th century. The Greeks equated mathematics with geometry and elevated it to the level of art. As a result planimetry and stereometry have reached a much more perfect level. The existence of only 5 different convex regular cubes (Plato), the lack of a common dimension with the side of the square (Pythagoras), the concept of numbers based on the theory of proportions (Eudoxus), the calculation of the face and length of curved shapes by volume, The study of conical sections (Apollonius Pergayos), sterographic projections (Ptolemy), geometric constructions, and various curves in this regard gives an idea of the level of development of Greek geometry. The problems of angle trisexation, cube doubling, square squaring, and regular polygons posed by Greek scientists were solved by the 19th century, and the problem of perfect and "friendly" numbers remains open. Greek Mathematics, in particular, was far ahead of its time in Archimedes research, using the ideas of integral calculus and the center of gravity. Greek scholars also had early knowledge of trigonometry (Hipparchus, Ptolemy), and Diophantus Arithmetic dealt with the theory of numbers. At the same time Mathematics flourished in Ancient China and India as well. The Chinese source "Nine Books of Mathematics" (II-centuries BC) provides rules for deriving squares and cubes from natural numbers. Later, Chinese scientists used the system of linear equations and the theory of deductions, in particular, the "Chinese theorem on residues." In the 5th century, Szu Chun-chji showed that the number p ranged from 3.1415926 to 3.1415927.

The Uzbek statehood, which has deep historical roots dating back more than three thousand years, has undergone many ups and downs. The emergence of developed countries as a result of the formation of the oldest state associations, the rapid development of the culture of the peoples of Central Asia as a result of the relations of these countries with the West and the East through the Great Silk Road have long fascinated scientists. has been intriguing since. Central Asia, including Uzbekistan, is a region with its own place and potential as one of the regions where human civilization is established. Our ancestors, who laid and developed the first foundations of modern science in their time, have carefully studied from ancient times the thinking, ideas, discoveries and wisdom created by the peoples of the West and the East. It is no coincidence that in the Middle Ages, the phrase "Light radiates from the East" appeared in the West. In ancient Turan, the scientific, spiritual and spiritual power was so strong that it could not be destroyed by various invasions, aggressions and evils. Even in such circumstances, our ancestors have preserved and further enriched the rich cultural, spiritual and scientific heritage of the national values and traditions. In these glorious days, we proudly mention the sacred names of our ancestors, who left a great legacy in the freedom of the country and the happiness of the people, the development of science and culture. Because the scientific heritage they have left us is a spiritual property, and this rich heritage reflects the interests of all mankind. If we look at the pages of our past history, we can see the works of our great ancestors, who studied the civilization of not only our people, but also the countries of the world and wrote about their history and culture with respect and dignity. This means that the development of science and culture is not a choice of the people, but an important educational factor in ensuring the mutual understanding of peoples. The content and scope of the scientific heritage of the great Eastern scholars is that this heritage still serves as an

important source for new scientific research, without losing its scientific and practical significance. The great thinker Abu Rayhan Beruni's book, India, is one of the most complete works on India of all time, and it is a source of research today. Our great ancestors have made a worthy contribution to human civilization with their scientific heritage. The scientific world of the East and the West is united and developed in harmony. Our scientists have benefited not only from the scientific achievements of Asia, but also from the scientific achievements of foreign thinkers, with a special emphasis on their further enrichment. In addition to their work in the fields of science, our great scholars wrote in ancient Greek, such as Aristotle, Ptolemy, Euclid, Democritus, Socrates, Pythagoras, Galen, mathematics, philosophy, medicine, geography, astronomy. who have translated hundreds of his finest works into Arabic and Syriac. These translations and their works played an important role in the formation and development of the science of the Ancient East. From a young age, our great scholars realized very early that true science requires knowledge of several languages, and therefore studied Arabic, Hebrew, Persian, Assyrian, Greek, and Sanskrit in addition to their mother tongue.

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