

Mathematicians and how Geometry Changed the World

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Abstract— This article shows Mathematicians and how Geometry Changed the World

1 Introduction

Geometry is an important branch of mathematics. Its origin goes back thousands of years and is primarily associated with the development of crafts, culture, arts, work with human activities and the supervision of the world. This is evidenced by the names of geometric shapes. For example, the name of "trapezoid" figure comes from the Greek word "trapezion" - table (Gordh and Headrick).

2 Body

In the fifth century BC, there was a decisive turn in the development of geometry. This development is connected with the name of Thales, a native of the city of Miletus. Thales was a merchant who spared his free time doing mathematics. He has made a great discovery: Thales found that many geometric patterns can be produced not by experience, but by means of reasoning (proofs). For example, he stated that if a triangle has the diameter of a circle as one side, and the third vertex is any point of the circumference of the circle, then the triangle is always a right triangle ("Thales Theorem - Math Open Reference"). Thales proved several other theorems. Thanks to his discoveries, the geometry became a real science in the third century BC. It becomes a science in which there is a small number of axioms (initial assumptions), and all other facts (theorems) are established by means of evidence. After Thales, a major contribution to the development of geometry was made by Eudoxus, Euclid, Archimedes.

According to the great Italian scientist Galileo, geometry is the most powerful tool for sophisticated mental abilities. It gives the opportunity to think and reason properly. Ancient Greek scientist Eratosthenes measured using the geometry of the circumference of the globe. He found that when the Sun is in Siena (Africa) over the head of Alexandria, located 800 kilometers, it deviates from the vertical by approximately 7 degrees. Eratosthenes concluded that the earth's center of the Sun can be seen at an angle of 7 degrees, and therefore the circumference of the globe is $360: 7 \times 800 = 41\ 140$ km ("Khan Academy").

For more than two thousand years, Euclid has been the undisputed legislator in the field of mathematics. He gave particularly good and harmonious presentation of geometry. The German philosopher Immanuel Kant considered the geometry of Euclid as the only possible way of this science. However, there was an exposition of Euclidean geometry,

which does not satisfy mathematicians. According to the Euclidian geometry, there is only one parallel line can be drawn in the plane through a given point, which is parallel to a given line ("Art Of Problem Solving"). Euclid considered this provision an axiom, some mathematicians have tried to prove it as a theorem. However, centuries passed, but mathematicians still failed to find evidence. This issue was resolved in the Lobachevskii geometry. In hyperbolic geometry, the sum of the angles of any triangle is less than 180 degrees. Two perpendicular to the same straight line farther away from each other. And there are a lot of facts in this geometry, which are not similar to those mentioned in school textbooks ("Hyperbolic Geometry - Triangles, Angles, And Area | Mathematical Association Of America"). However, there are no contradictions in this geometry. Euclidean geometry, which is taught in school, is the simplest form of all geometries, but at the same time is the most necessary and useful.

3 Conclusion

Geometric knowledge is widely used in our daily life - at home, at work and in science. When buying wallpaper, it is necessary to know the area of the walls of the room; in determining the distance to an object, observed from two points of view, you need to use the well-known geometric theorems; in the technical drawings manufacturing, we have to perform geometric constructions. Thus, the geometry is a good basis for solving scientific or everyday problems.

References

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