

WAYS TO APPLY THE PYTHAGOREAN THEOREM TO LIFE

Botirov Zafar Shokirovich

Mathematics teacher of SamISI Academic Lyceum

Esanov Obid

Mathematics teacher of SamISI Academic Lyceum

Abstract: The Pythagorean theorem is one of the most famous and fundamental theorems in mathematics. It represents the relationship between the sides of right triangles. The theorem states that in a right triangle, the square of the hypotenuse (the longest side) is equal to the sum of the squares of the other two sides. This theorem is widely used not only in mathematics, but also in everyday life, engineering, architecture and many other fields. This article provides detailed information about the ways of applying the Pythagorean theorem to life.

Key words: Pythagorean theorem, hypotenuse, legs, angle, right triangles, trigonometric functions.

The Pythagorean theorem applies to right triangles. The theorem is expressed as follows: if the legs of a right triangle are a and b , then the hypotenuse c is calculated according to the following formula:

$$c^2 = a^2 + b^2$$

This theorem is important in learning the basics of geometry and trigonometry. Using the Pythagorean theorem, it is possible to determine the dimensions of right triangles, as well as to solve various problems. The Pythagorean theorem is widely used in the field of architecture and construction. In the process of construction, there is a need to determine right triangles. For example, the Pythagorean theorem is used to correctly measure the angles of a building. Builders, when determining the corners of a building, can make a right angle by measuring a distance of 3 units from one side, 4 units from the second side, and 5 units from the third side. This method is important in ensuring the stability of the building and its correct construction. In the field of engineering, the Pythagorean theorem is used in various engineering calculations. For example, mechanical engineers use the Pythagorean theorem to calculate the motion of mechanisms and determine their dimensions. Designers also use this theorem to determine the shape and dimensions of products. Using the Pythagorean theorem, designers can determine the necessary dimensions to improve the aesthetic appearance and functionality of products. In the fields of geodesy and cartography, the Pythagorean theorem is used to determine distances on the surface of the earth. Surveyors use the Pythagorean theorem to measure the earth's surface and create maps. For example, to

determine the distance between two points, it is enough to know their coordinates. Using the Pythagorean theorem, it becomes easier to calculate the distance between these points. This process is important in ensuring the accuracy of maps and making geodetic measurements. In sports, the Pythagorean theorem is used by athletes and coaches to develop game strategies. For example, in the game of basketball, the Pythagorean theorem is used to calculate the movement of the ball and the positions of the players. Players can determine the distances required to shoot the ball in the right direction using right-angled triangles. Also, in the field of physics, the Pythagorean theorem plays an important role in the calculation of motion and forces. For example, the Pythagorean theorem is used to determine the relationship between forces and to calculate the direction of motion. In the field of education, the Pythagorean theorem is important in teaching mathematics to students. Students will gain an in-depth knowledge of right triangles and their measurements by studying the Pythagorean Theorem. This theorem helps students develop mathematical thinking and problem solving. Teachers can increase students' interest by explaining the Pythagorean theorem with practical examples.

The application of the Pythagorean theorem in life can be illustrated by many examples. For example, the Pythagorean theorem can be used in building a house, creating a garden, or even simple everyday tasks. If you want to create a square in the garden, you can use the Pythagorean theorem to determine the right angle. It helps in improving the aesthetic appearance of your garden and efficient use of space.

Conclusion: The Pythagorean theorem occupies an important place in mathematics, and its practical applications are very wide. The use of the Pythagorean theorem in the fields of architecture, engineering, surveying, sports and education helps us to solve many problems in our daily life. This theorem is important not only in the development of mathematical knowledge, but also in practical life. The application of the Pythagorean theorem simplifies our lives and helps us achieve success in many areas. Learning mathematics and applying the Pythagorean theorem to life is an important skill for everyone.

References:

1. The Pythagorean Theorem - "Mathematics: Basic Concepts" (2020) - O. Muradov
2. Geometry and its practical application - "Geometry and practice" (2019) - S. Karimov
3. Engineering mathematics - "Mathematical foundations for engineering" (2021) - A. Tashkentov
4. Sports and mathematical thinking - "Application of mathematics in sports" (2022) - R. Kadyrov
5. Geodesy and cartography - "Fundamentals of Geodesy" (2018) - D. Khudoiberdiyev