**Scene 01**

Pythagorean theorem or Pythagoras’s Theorem states a fundamental relationship between the sides of all right-angled triangles.

It states that the area of the square formed using the hypotenuse, the side opposite to the right angle is equal to the sum of the areas of the squares formed by the other two sides. Even though this theorem is attributed to Pythagoras, there is archaeological evidence to prove the knowledge of this relationship was present many centuries before him among various civilizations like Egypt, Mesopotamia, India and China.

**Scene 02**

Pythagorean theorem is heavily used in industries like architecture, construction, navigation, aviation surveying, etc.

In construction projects, right angles are made using a triangle whose sides are a Pythagorean triple. A Pythagorean triple is a set of 3 positive integers which can be used to draw a triangle satisfying the Pythagoras theorem. Preferably numbers 3,4 and 5 is such an example.

In marine navigation, the shortest distance between two points can be calculated using the Pythagoras theorem. Pilots use this to calculate ascend and descend paths for their aircrafts.

Surveyors use Pythagorean theorem to calculate the slope of a land and to calculate the area of non-uniform blocks of lands or surfaces.

**Scene 03**

The relationship among the sides of a right-angled triangle was helpful in solving many problems in mathematics.

In fact, this knowledge led to whole new fields in mathematics like trigonometry and complex number arithmetic.

Pythagoras Theorem is considered as an axiom in modern mathematics. An axiom is a generally agreed upon concept to be true by everyone in a specific field.

**Scene 04**

Pythagorean theorem has been proven over 300 times by various people over the last thousands of years. Among those who came up with a proof are Euclid – The father of Modern Geometry, Albert Einstein – Father of Modern Physics and Former U.S. President James Garfield were few notorious individuals.

To gain a better understanding of the concept, I have chosen one of the simplest proofs which prove the theorem using rearrangement of triangles.

**Scene 05**

5.1

Let's consider a right-angled triangle with sides a, b, and c where c is the hypotenuse or the side opposite to the right angle.

5.2

Let's make four copies of the triangle and arrange them as shown in the screen. The area marked by the blue square will be kept constant during the process.

5.3

The area of the free space can be represented as c 2 because all of its sides are made of the hypotony of the triangles. This area is colored in orange.

5.4

Let's rearrange the Triangles to separate the free space into two smaller squares.

The purple-colored square is having “a” for its all sides while the cream-colored square is having “b” for its all sides.

Therefore, the areas can be represented as a 2 and b 2 respectively.

5.5

As the combined area is equal to the orange square’s area, that is c2. We can represent the relationship as a2 + b2 = c2. Thus, proving the Pythagorean theorem.

5.6

To obtain the lengths of the sides, this equation can be simplified as c = √ (a2 + b2).

**Scene 06**

Thank you very much for your time and efforts in evaluating this presentation.