

Definition 1. The longest side of a triangle with a right angle is called the *hypotenuse*.

Note. The other sides are called *catheti*, or *legs*.

Theorem 1 (Pythagoras). *In any right triangle, the square of the hypotenuse equals the sum of the squares of the other sides.*

Proof. The proof has been given in Euclid's Elements, Book 1, Proposition 47. Refer to it for details. The converse is also true, see lemma 1. \square

Lemma 1. *For any three positive numbers x , y , and z with $x^2 + y^2 = z^2$, there is a triangle with side lengths x , y and z . Such triangle has a right angle, and the hypotenuse has the length z .*

Note. This is the converse of theorem 1.