

$= c^2$. Construct a second triangle with sides of length a and b containing a right angle . By the Pythagorean theorem , it follows that the hypotenuse of this triangle has length $c =$

$\sqrt{a^2 + b^2}$, the same as the hypotenuse of the first triangle . Since both triangles ' sides are the same lengths a , b and c , the triangles are congruent and must have the same angles . Therefore , the angle between the side of lengths a and b in the original triangle is a right angle .

The above proof of the converse makes use of the Pythagorean Theorem itself . The converse can also be proven without assuming the Pythagorean Theorem .

A corollary of the Pythagorean theorem 's converse is a simple means of determining whether a triangle is right , obtuse , or acute , as follows . Let c be chosen to be the longest of the three sides and $a + b > c$ (otherwise there is no triangle according to the triangle inequality) . The following statements apply :