



**ICT in SES**

# **Example project in Geometry**

Lesson №25

# Demonstration

# Demonstration

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## Example project “Right-angled triangle”

- Minilesson
- Interactive part
- Instructions
- Problems
- Solutions

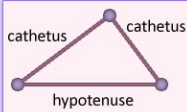
Right-angled triangle

# Right-angled Triangle


Demonstration example | Pavel Boytchev | 2015 (translated 2020)

## I. Introduction

A **right-angled triangle** is triangle with one of the inner angles  $90^\circ$ . The sides that make a right angle are called **catheti**. The third side opposite to the right angle is called **hypotenuse**.



Right-angled triangle



The Pythagoras theorem is a case of the more general formula for finding an angle in a triangle using the length of its sides. If we look for angle  $\gamma$ , opposite to the side  $c$  and concluded between  $a$  and  $b$ , then:

$$\cos(\gamma) = (a^2 + b^2 - c^2)/(2ab).$$

For a right-angled triangle,  $\gamma = 90^\circ$ , therefore,  $\cos(\gamma) = 0$  and  $a^2 + b^2 - c^2 = 0$ , which corresponds to the Pythagoras Theorem.

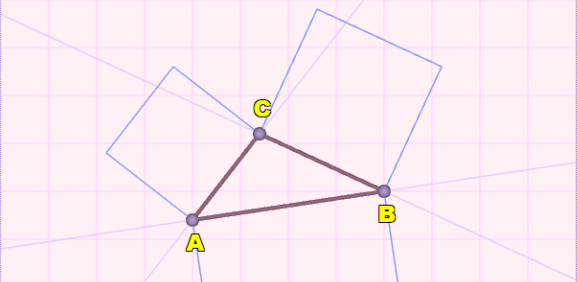
## III. Problems

For the next problems use the formulae in II and the interactive canvas in IV.

Right-angled triangle

## IV. Interactive canvas

☒ Lines ☒ Squares ☒ Grid ☒ Alignment ☐ Precision

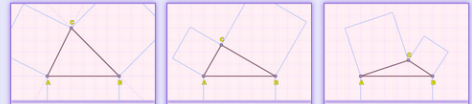


Right-angled triangle

- if  $a^2 + b^2 > c^2$ , the angle is acute;
- if  $a^2 + b^2 = c^2$ , the angle is right;
- if  $a^2 + b^2 < c^2$ , the angle is obtuse.

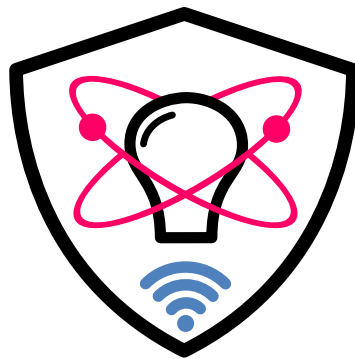
To determine the type of the triangle it is needed to know the type of the largest angle. This angle is opposite to the longest side.

The three illustrations below present these three cases. In each case side  $AB$  is the longest. In the left illustration the sum of areas of catheti squares is bigger, thus the triangle is acute. In the middle illustration the areas are equal, so the triangle is right-angled. The right illustration features smaller sum of areas and an obtuse triangle.



TRY IT

# Discussion



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**The end**

Comments, questions