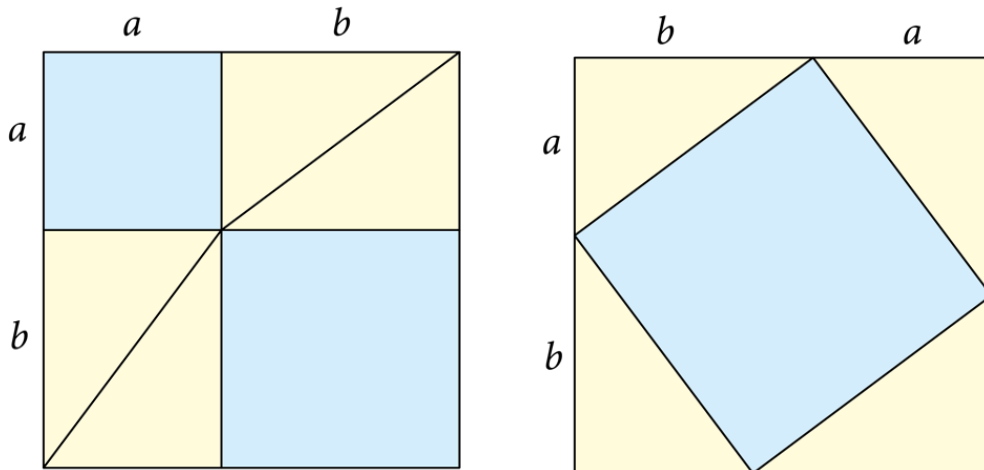


Discovering the Pythagorean Theorem

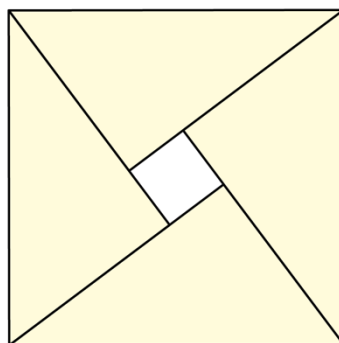
Of course, you need a proof showing why your conjecture holds for all right triangles. There are more than 300 different proofs of the Pythagorean Theorem. Here are two examples:

1. A Pythagorean puzzle:



- Try to justify the Pythagorean conjecture with the help of this puzzle.
- Prove the theorem only with the help of the diagram on the right.

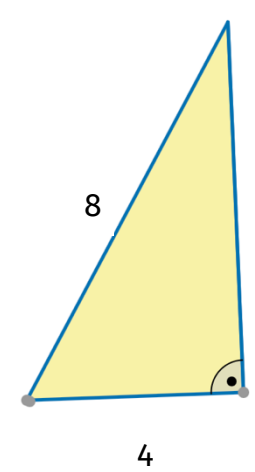
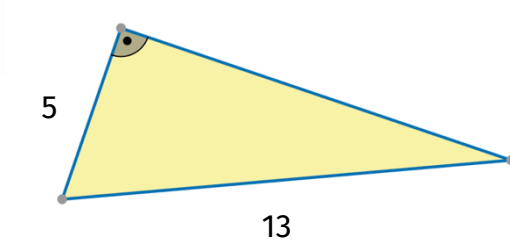
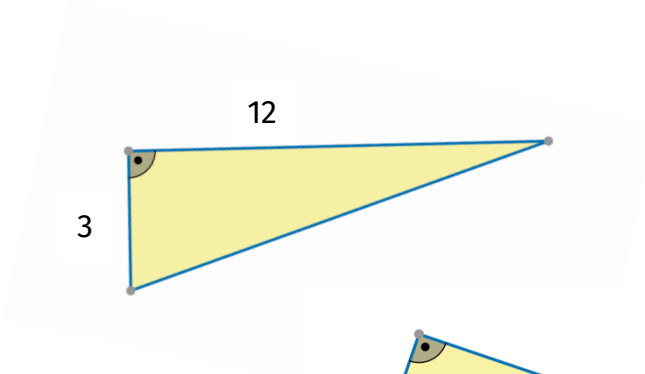
2. One famous proof of the Pythagorean Theorem is by the Hindu mathematician *Bhaskara* (1114 – 1185).



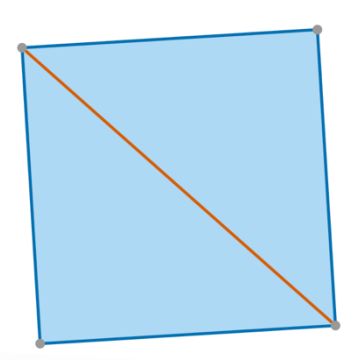
The letters a , b stand for the legs, the letter c for the hypotenuse of the right triangle. Use algebra to explain why the above diagram proves the theorem.

3. The Pythagorean Theorem about areas of squares is often used to calculate lengths.

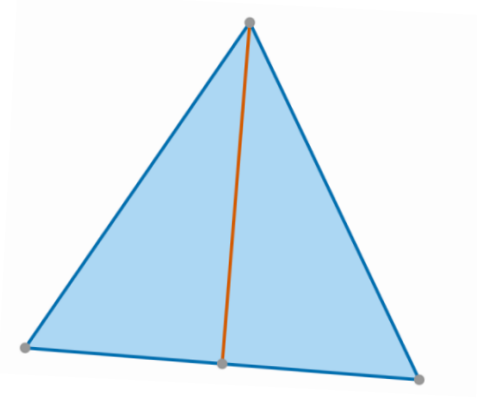
- ▶ Find each missing length. All measurements are in centimeters



- ▶ Square with side length a .
Find the length d of the diagonal.



- ▶ Equilateral triangle with side length a .
Find the length h of an altitude.



- ▶ Determine the length d of a space diagonal in a rectangular solid with the side lengths a, b, c .
- ▶ What is the edge length of a cube whose space diagonal is 10cm long?