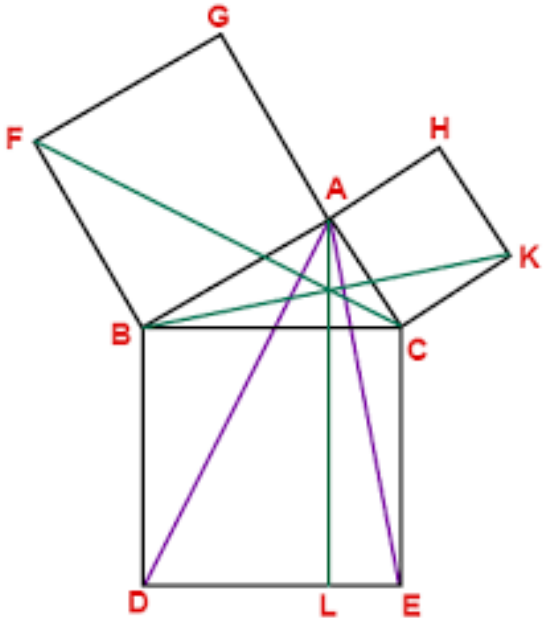
Pythagoras Made Easy

Help! I almost flunked Geometry because I couldn’t understand the proof of the Pythagorean Theorem.

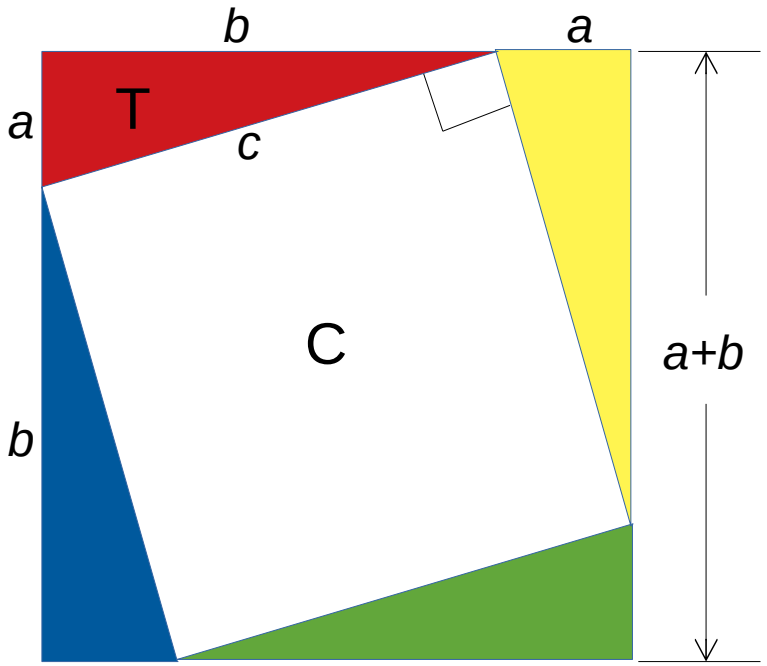
Why? Euclid's Proof.



- Requires too many steps.*
- Is unnecessarily complex and difficult to remember.
- Relies on complicated constructions, triangles in parallelograms, side-angle-side, etc...
- The theorem can be proven in just three simple, easy to remember steps.

*https://www.cut-the-knot.org/pythagoras/Proof1.shtml

Step 1

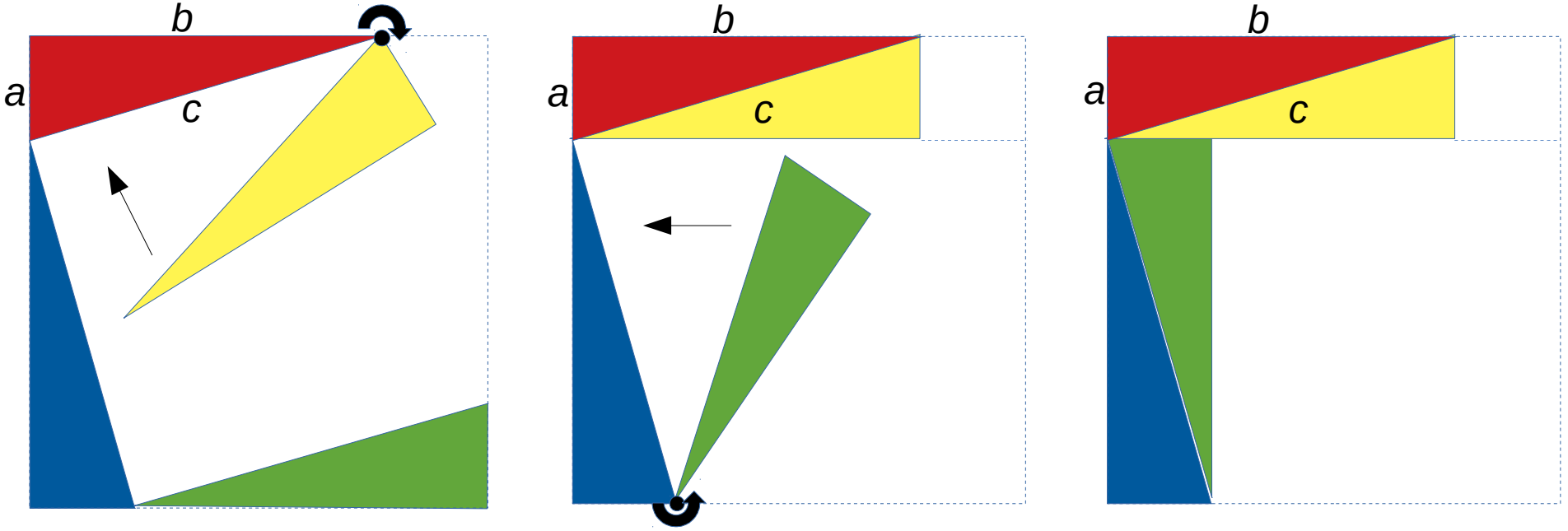


Big Square 1

- Layout four, congruent right triangles in a big square as shown to the left.
- Let *a* and *b* be the legs and *c* be the hypotenuse.
- Let T be the area of each triangle. (T = ½ ab)
- Let C be the square on the hypotenuse.
- Note that the area of Big Square 1 is the sum of the four triangles plus square C. That is,

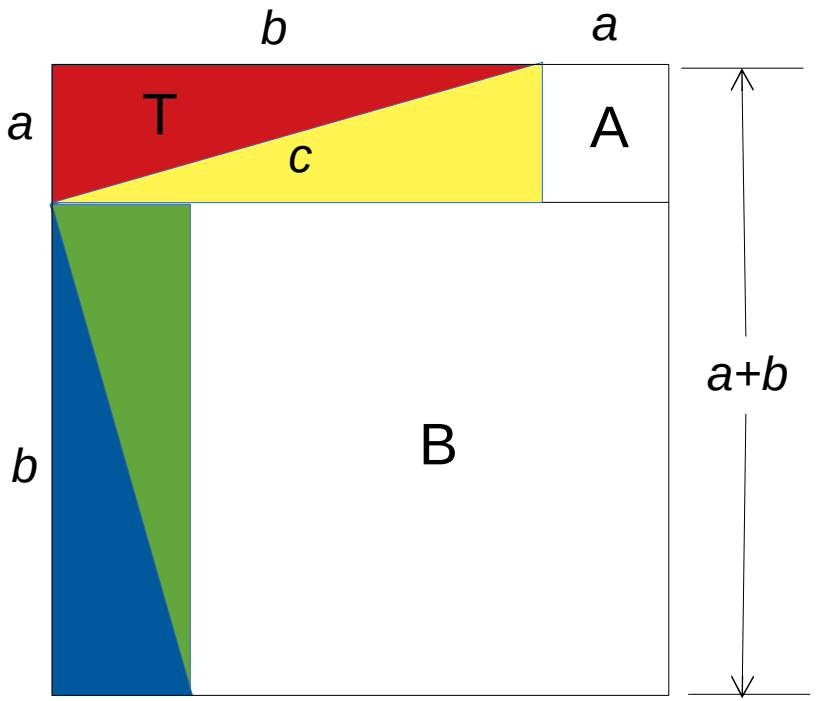
$$\text{Area}_{\text{Big Square 1}} = 4T + C$$

Mezzanine Step



Rotate the Yellow and Green triangles as shown above.

Step 2



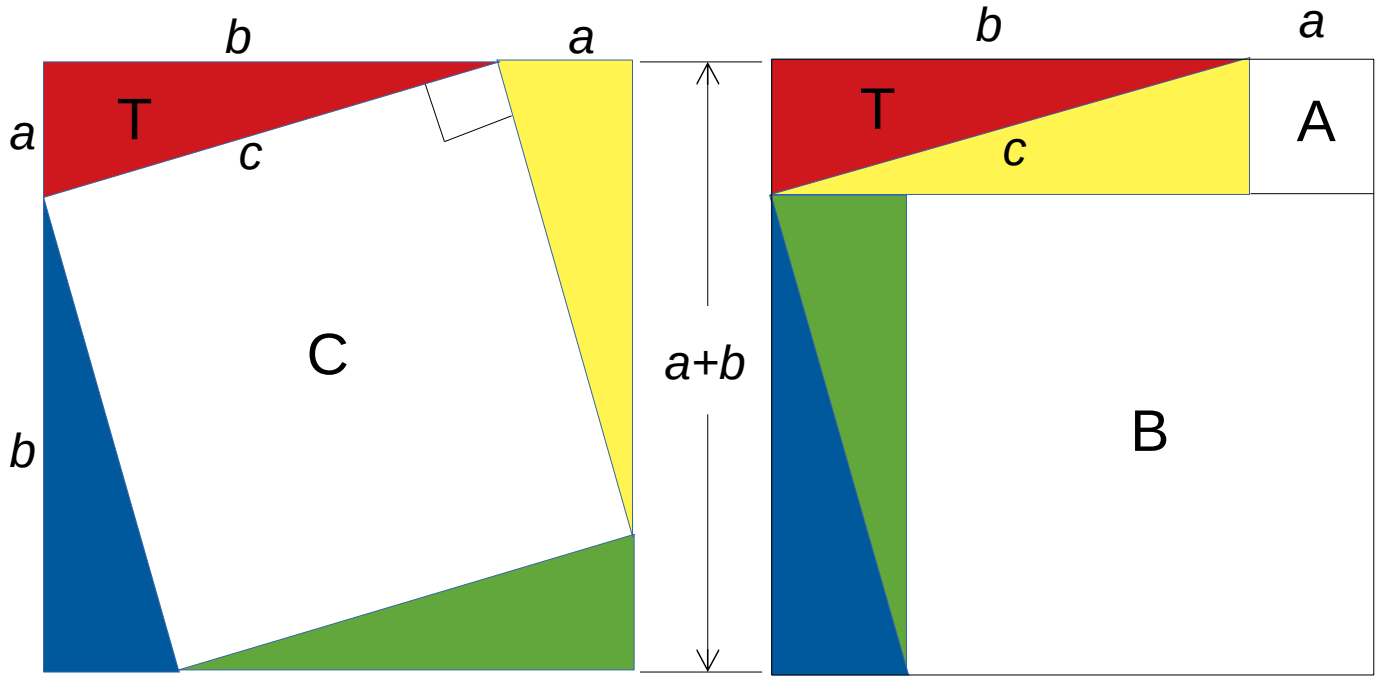
Big Square 2

- Let A be the square on side *a*.
- Let B be the square on side *b*.
- Note that the area of Big Square 2 is the sum of the four triangles plus square A plus square B. That is

$$\text{Area}_{\text{Big Square 2}} = 4T + A + B$$

Step 3

- Equate the two big squares.



Big Square 1

Big Square 2

Conclusion

- Note that Big Square 1 is the same size as Big Square 2. (Side equals $a + b$). Therefore

$$\text{Area}_{\text{Big Square 2}} = \text{Area}_{\text{Big Square 1}}$$

- Substituting from steps 1 and 2

$$4T + A + B = 4T + C$$

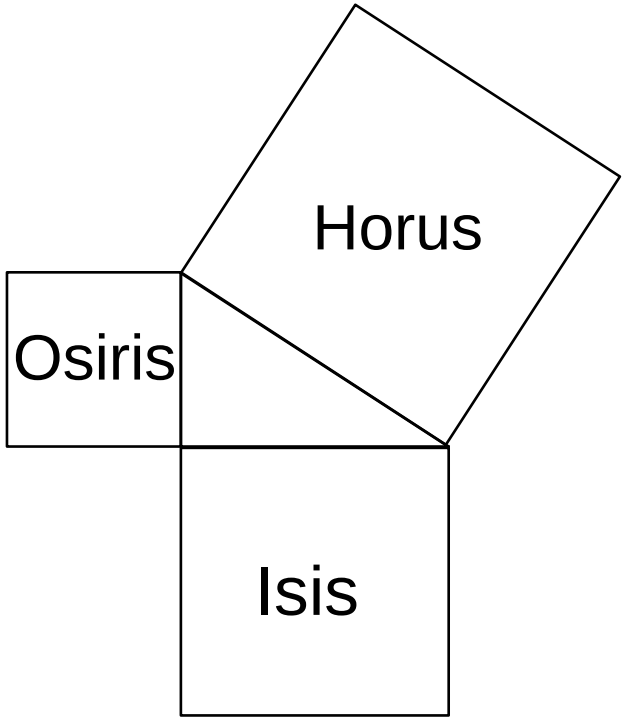
- Subtract out the four triangles from each side of the equation

$$A + B = C$$

which expressed algebraically is

$$a^2 + b^2 = c^2 \quad \textbf{QED}$$

Why the Euclid Proof?



Euclid's Construction:

- Symbol used by ancient occult mystery schools
  - Base represents Isis – the subservient wife lying on her back.
  - Height represents Osiris – the upright man standing over his wife.
  - Hypotenuse represents Horus – the magical (or divine) child resulting from the union of Isis and Osiris.
- Often appears in pendants worn by mystery school initiates, such as Freemasonry.*
- Was Euclid an initiate of the ancient occult mystery schools?

* Christian J Pinto, *Riddles in Stone*, 2007

On Github

This presentation available on Github at

https://github.com/fractalxaos/barcamp/