

# Infinite Similar Triangles

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Figure 1: Infinite Similar Triangles Embroidery

Figure 1 shows “Infinite Similar Triangles,” an embroidery work that I created based on the right-angle triangle construction used by high school students, Calcea Johnson and Ne’Kiya Jackson, in their 2023 proof of the Pythagorean Theorem. In this proof, a right-angle triangle is constructed by concatenating an infinite series of increasingly small congruent triangles.

To create the embroidery, I traced a visualization made in Maple Learn (See Figure 3) onto a piece of cotton. Due to the physical limitations of the embroidery medium (a stitch can only be so small), “Infinite Similar Triangles” is an eleven-triangle approximation of the Jackson-Johnson triangle (See Figure 2). I used 7 alternating colours to construct the congruent triangles. Throughout the whole design, I used a satin stitch, which is used to create solid, flat shapes with parallel stitches. Furthermore, using this stitch means that the same triangle pattern can be seen on the back side of the fabric as well as the front.



Figure 2: Close-Up of Infinite Similar Triangles Embroidery

The amazing story behind the proof is explained in the [“New Proof of the Pythagorean Theorem!”](#) Maple Primes blog post. The mechanics of the proof are detailed in the [“Jackson and Johnson’s Proof of the Pythagorean Theorem”](#) document on Maple Learn, from which Figure 3 was taken. An exploration of the triangle’s construction for different side lengths can be found in the [“Jackson and Johnson’s Triangle Construction”](#) Maple Learn document.

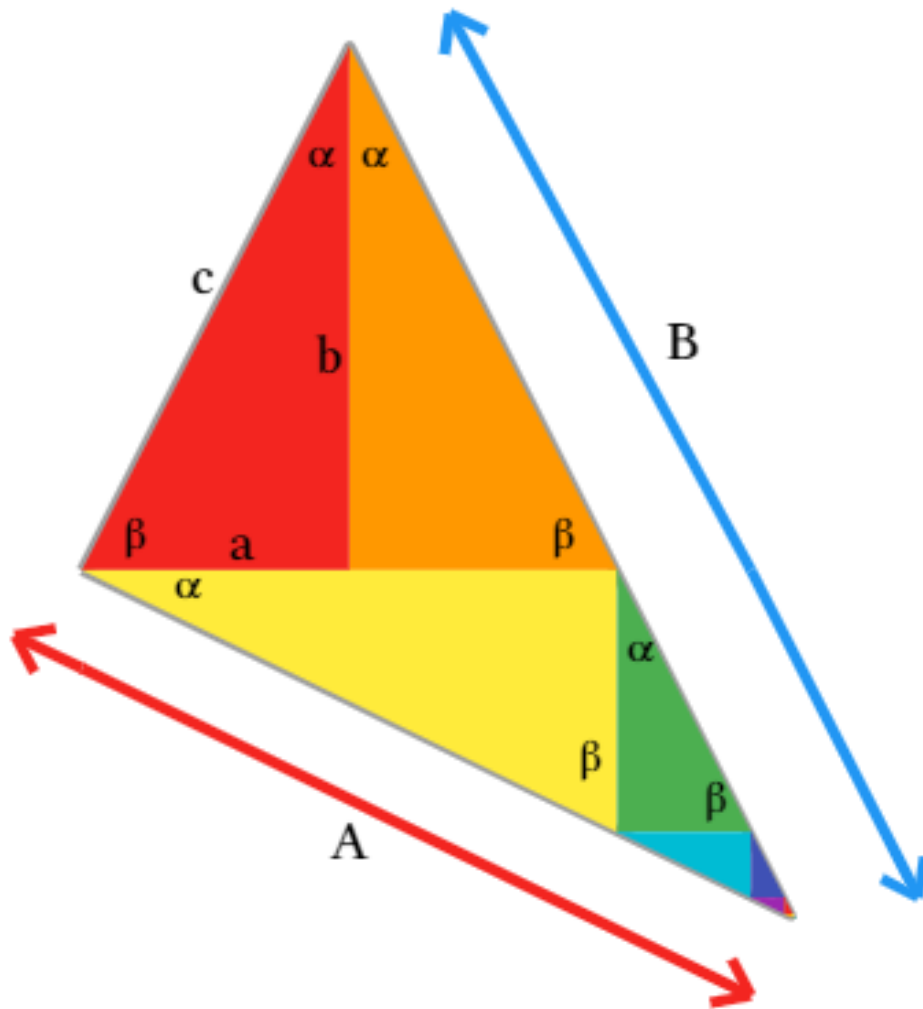


Figure 3: Infinite Similar Triangles Construction on Maple Learn