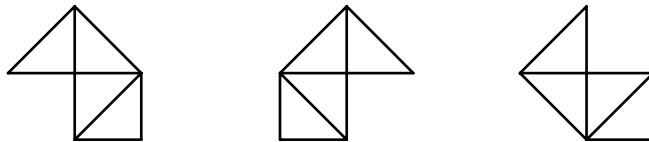


Shapes from Four Triangles: (Adapted from Shapes and Measurement, written by the Reconceptualizing Mathematics Project at San Diego State University.)

Given four congruent isosceles right triangles, how many different polygonal regions can you make, using all four triangles each time? Two shapes are said to be the same if some combination of a slide, a rotation, or a flip will transform the first shape into the second shape. To answer the question of “how many?” you will probably want to find and display all possible Shapes from Four Triangles. Once you have done this, your task is to find an argument that **proves** you have found a complete set of Shapes from Four Triangles. I.e., how would you explain to someone who isn’t looking at the shapes that

- i) your shapes are all different, and
- ii) there are no more left to be found?

Note: The following three are all the SAME polygonal region (perhaps called square-with-sail), since some rigid motion shows they are congruent and hence they are not really different shapes.



If it is not clear, the intent is that a side of one triangle should fit exactly on a congruent side of an attached triangle. Making a shape involving something like the following is not allowed:

