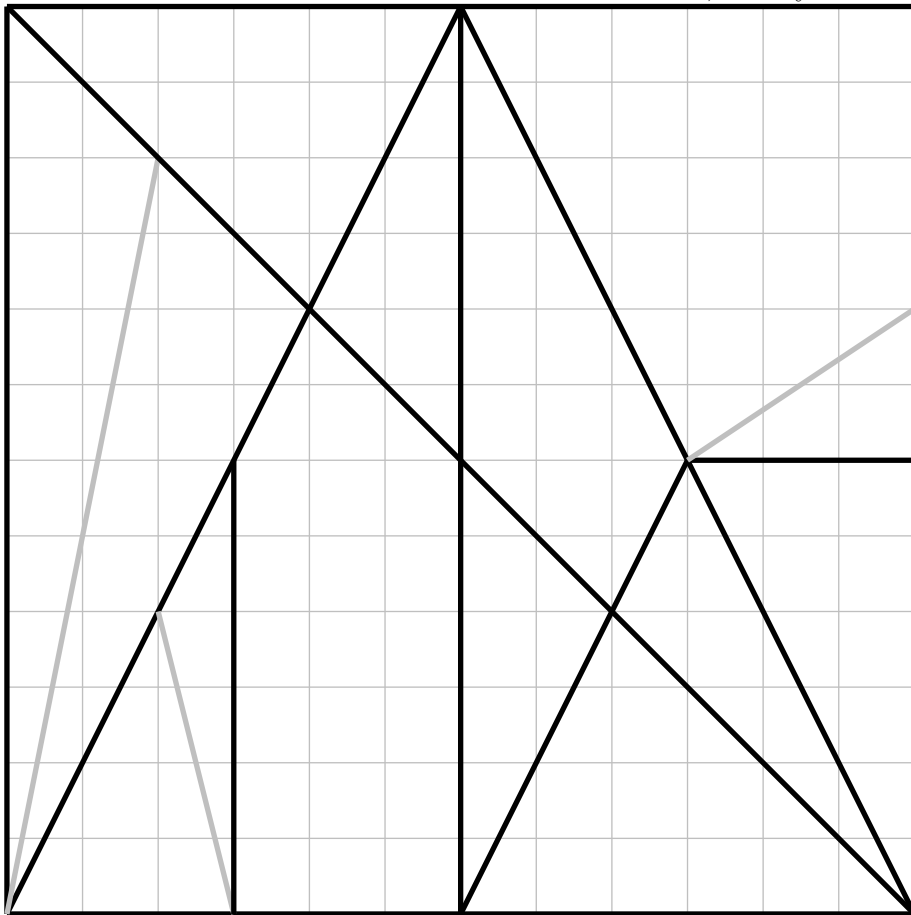


Archimedes' box puzzle

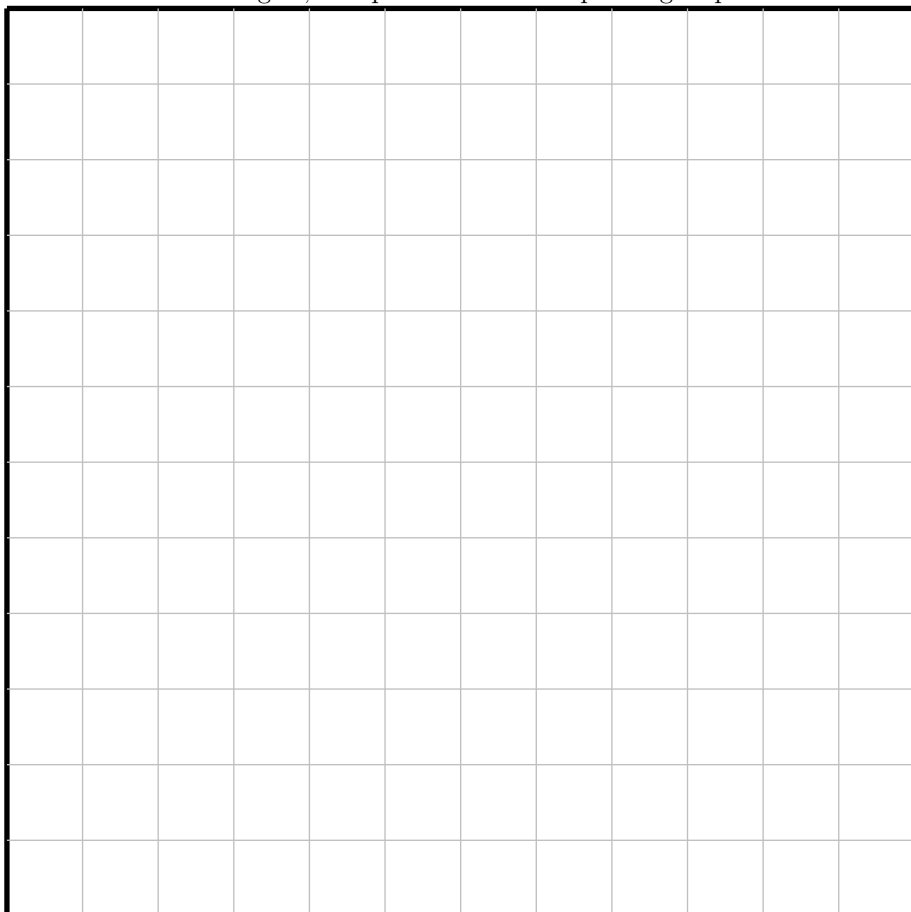
For Kenilworth maths club, Friday 23rd November 2018



This is said to be the oldest puzzle in the world, dating back over 2200 years, and investigated by the ancient Greek mathematician Archimedes. It is also called "Archimedes' Stomachion"

Cut out the pieces along the bold lines. Colour in before cutting if you want. Try and put together to form the square, without looking at the possible solution. Try finding a different solution! There are 536 possible solutions - this was only discovered in 2003 by mathematician Bill Cutler.

For a simpler version of the puzzle, don't cut along the grey lines - it turns out that the pieces on either side of these lines must always come together when you make the square (though they might not in making other shapes). It is easier to use the grid, and put corners of shapes at grid points.



If you can do this one, try other shapes, like triangles, diamonds, rhombuses, parallelograms, and rectangles, and other shapes.

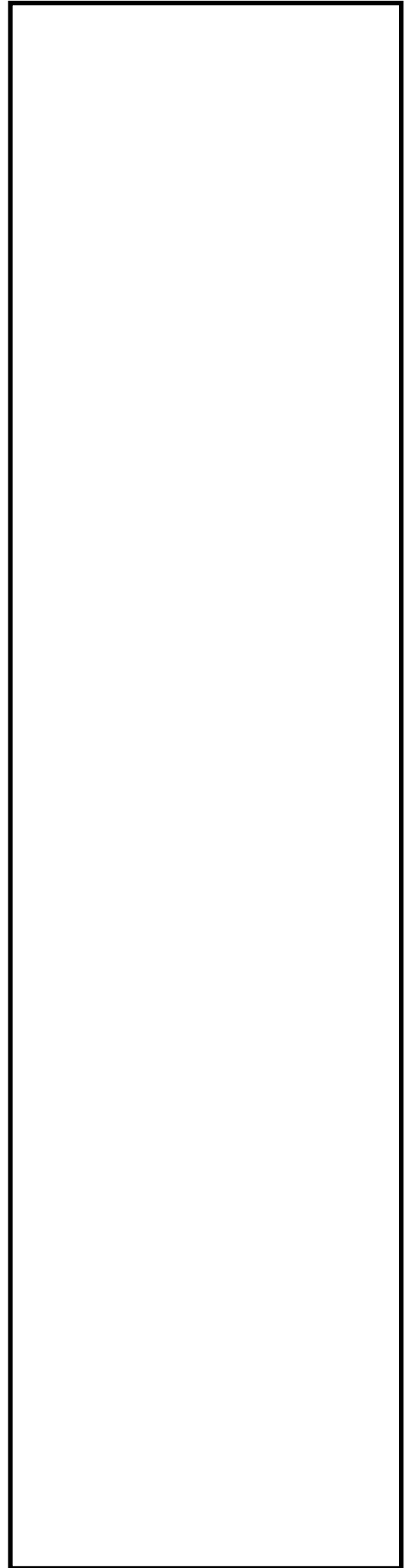
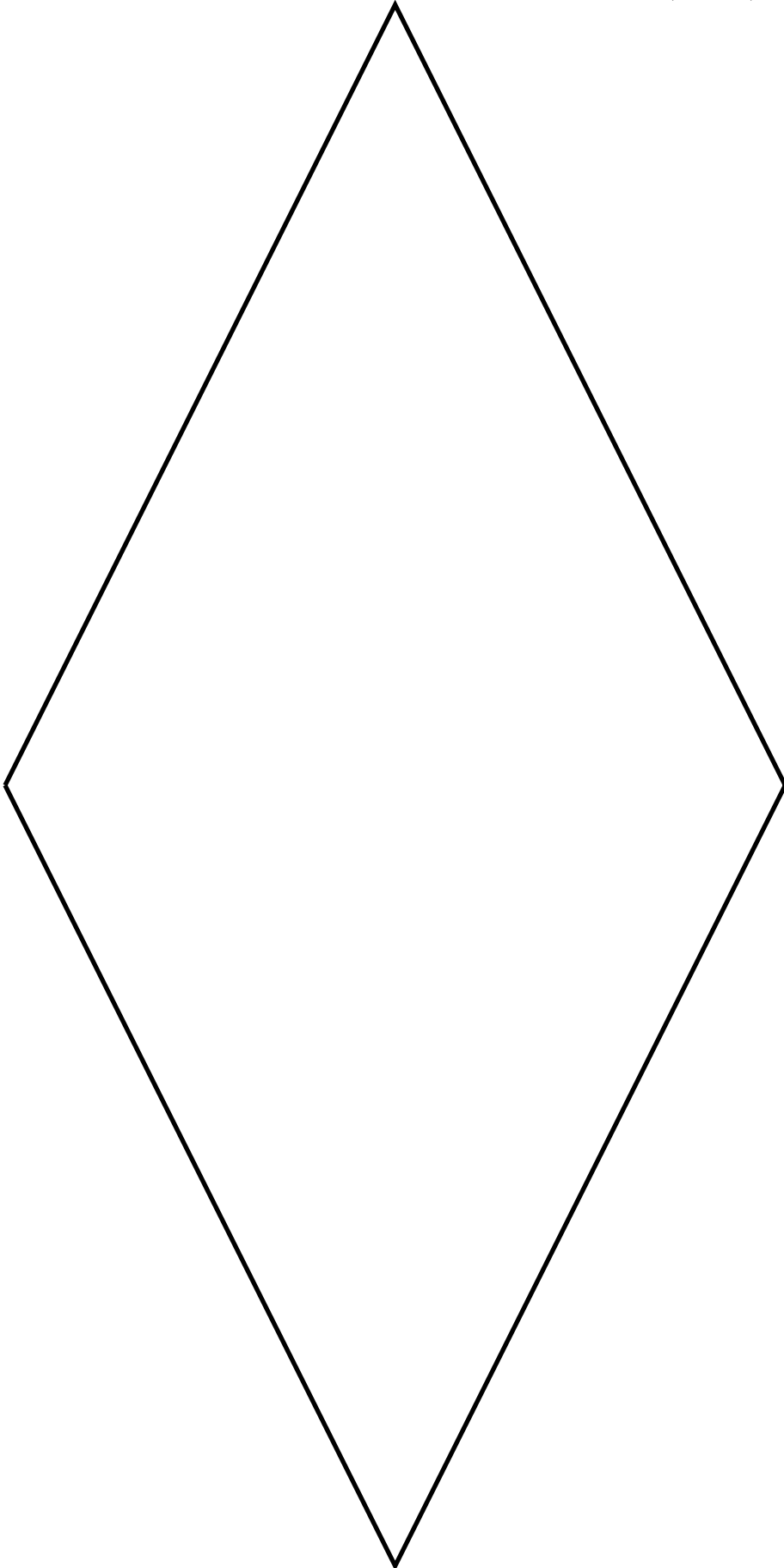
Further questions for discussion:

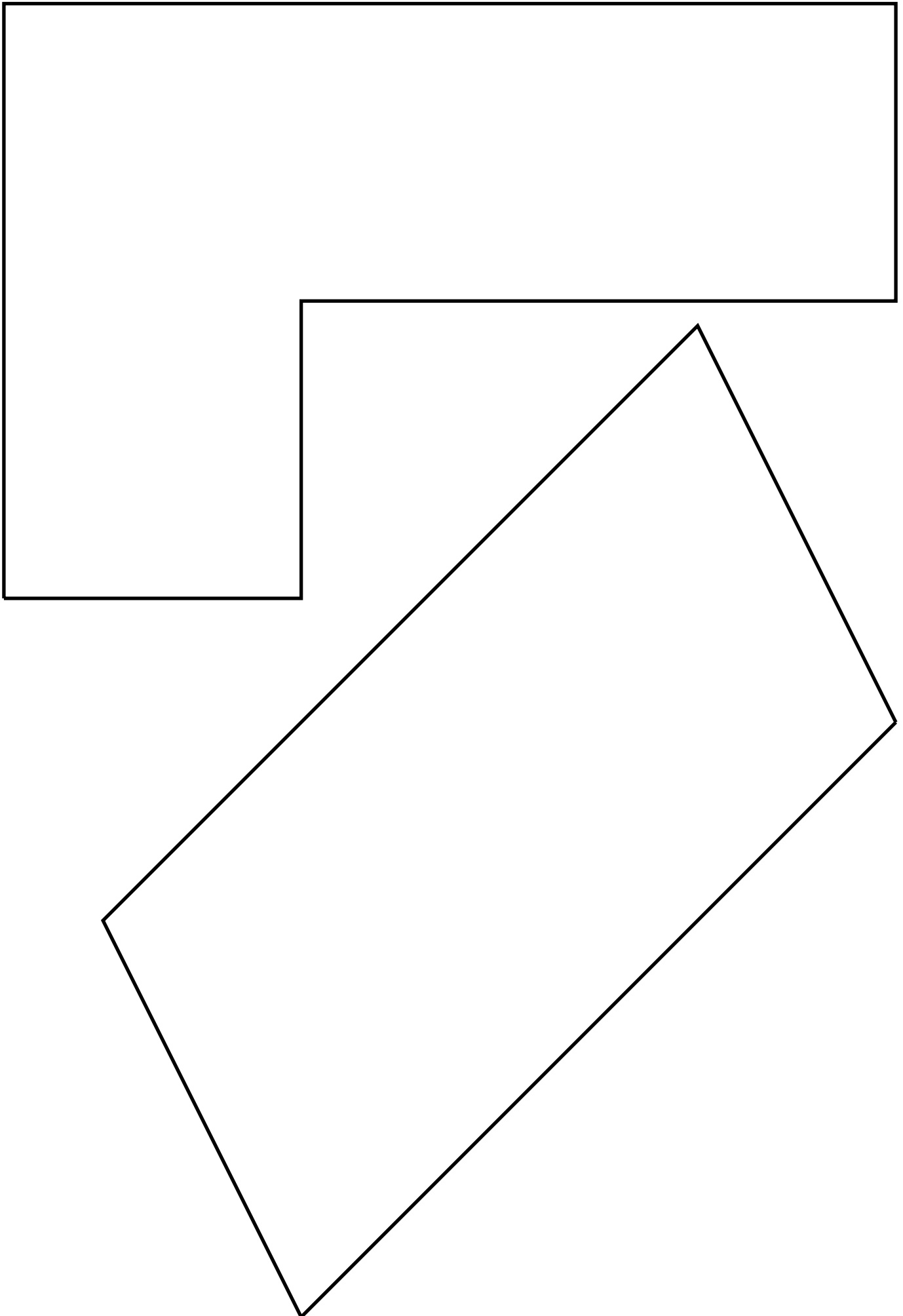
- How does this compare to the tangram?
- Is this a good puzzle? Why?
- Why was Archimedes so interested in this puzzle?
- Can you make up other tangram like puzzles?
- Is it better if there is only one way to put together pieces, or lots of ways?

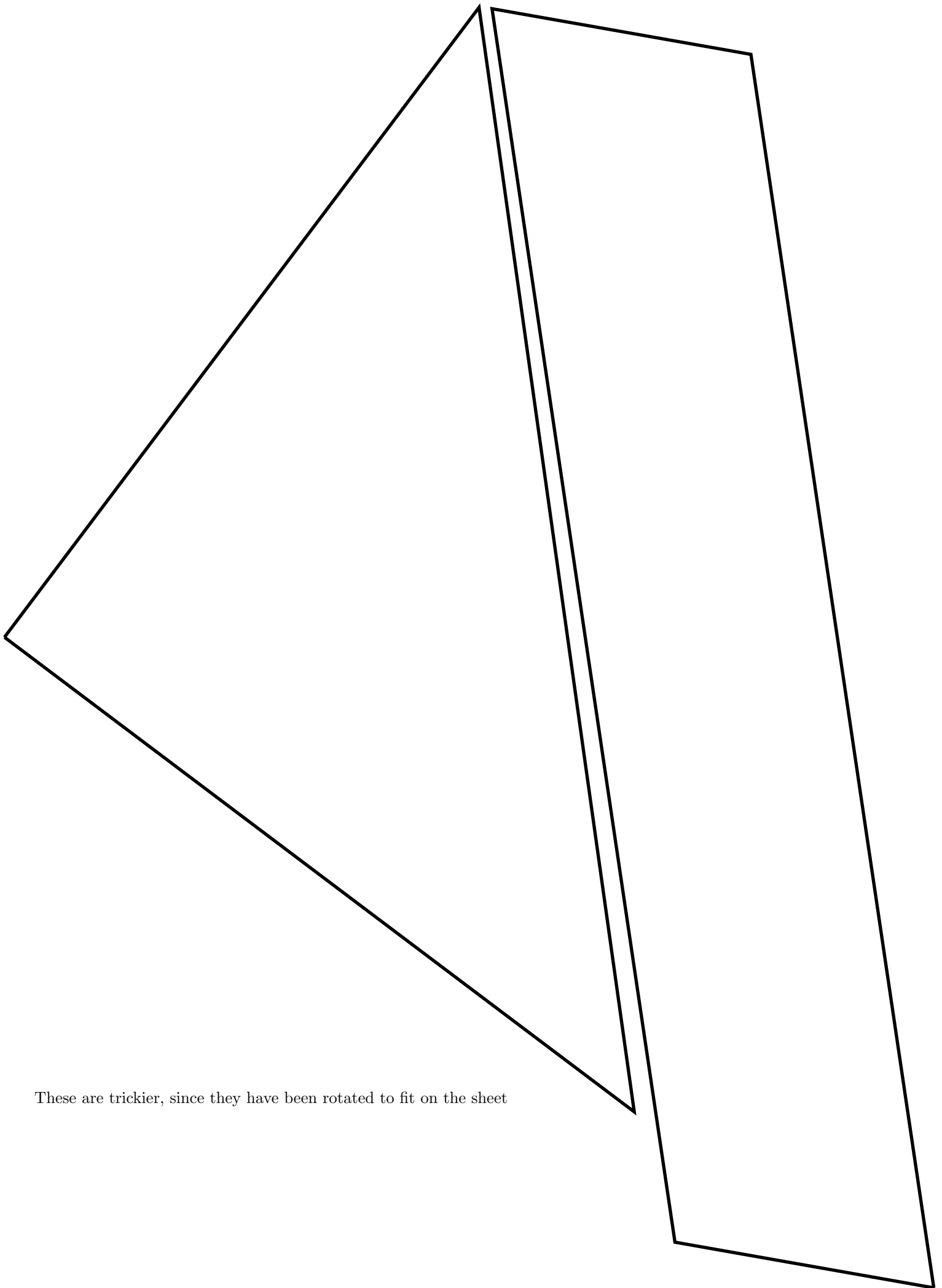
More Archimedes Box puzzles - sheet 1

Other shapes to fill in with all 14 pieces (notice that even though these shapes look quite different they must all have the same area as the square).

It may help to draw these shapes on grid paper, since the corners (vertices) of the pieces can then be put on grid points.







These are trickier, since they have been rotated to fit on the sheet