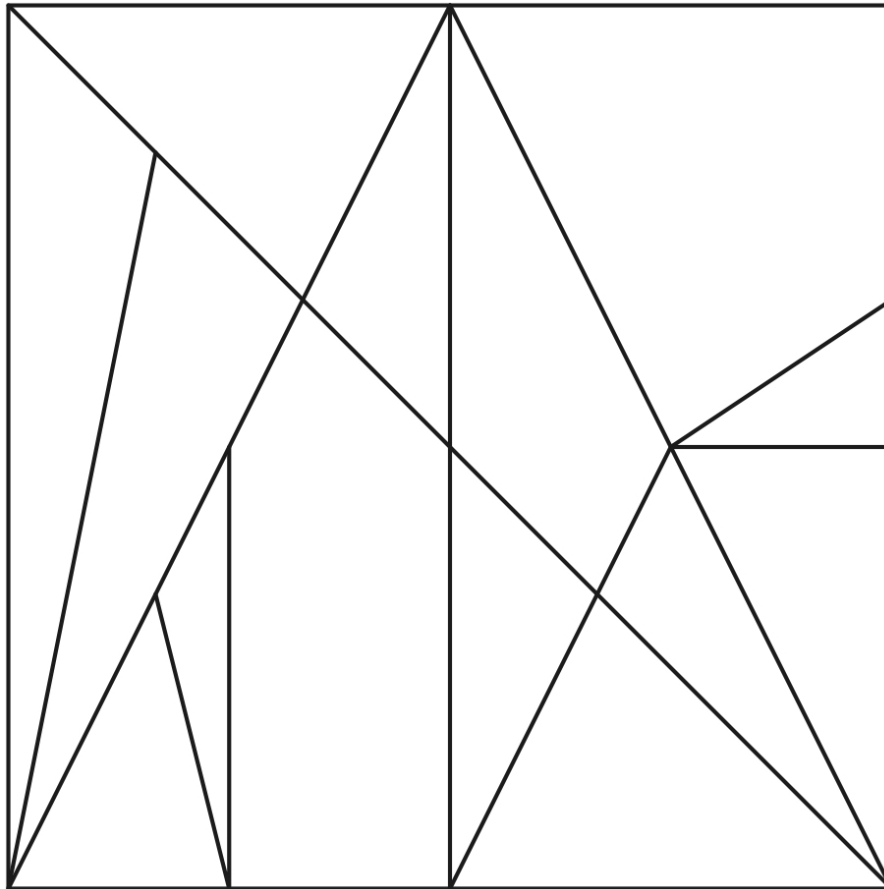


Archimedes' Puzzle

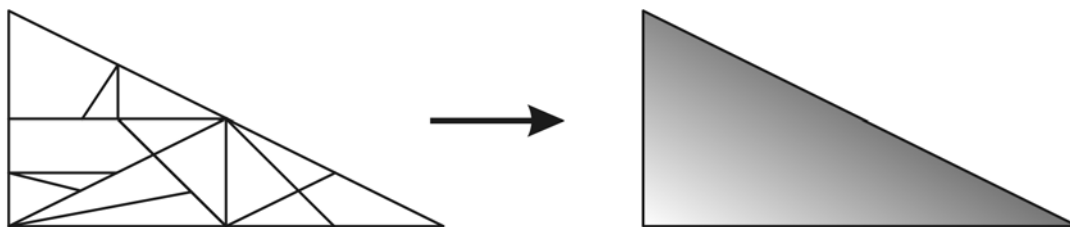
NAME _____

The *Stomachion* is a puzzle that is at least 2,200 years old. It was known to the ancient Greeks. Some people think that it was created by the Greek scientist Archimedes, which is why it is sometimes called *Archimedes' Puzzle* or the *Loculus of Archimedes*.

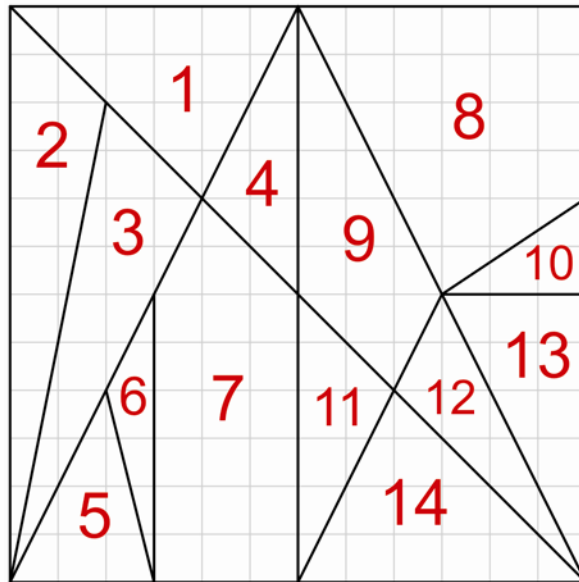
The puzzle consists of 14 pieces of various shapes and sizes. These pieces are created by dividing a square as shown below. The object of the puzzle is to rearrange the pieces to form other shapes.



Cut out the pieces of the *Stomachion*. Then, rearrange the shapes to create the triangle shown below. The figure on the left shows how the pieces must be arranged to form the triangle.



4. When the original 14 pieces are used to create a square, the result can be placed on a 12×12 grid so that the sides of the shapes intersect at *lattice points* (points on the grid where horizontal and vertical lines meet). This arrangement is shown below.



Find the area of each piece.

- | | |
|----------|----------|
| 1 _____ | 2 _____ |
| 3 _____ | 4 _____ |
| 5 _____ | 6 _____ |
| 7 _____ | 8 _____ |
| 9 _____ | 10 _____ |
| 11 _____ | 12 _____ |
| 13 _____ | 14 _____ |

5. What do you notice about the areas of all of the pieces?