Polygon Puzzle

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DAVID HILBERT was a German mathematician. Fifty years ago he proved a wonderful fact about polygons. A polygon is a figure whose sides are straight lines. Some polygons are pictured on the following pages. David proved that if any two polygons take up the same amount of space, then either one can be cut into smaller polygons in such a way that the pieces can be fitted together again in the shape of the other.

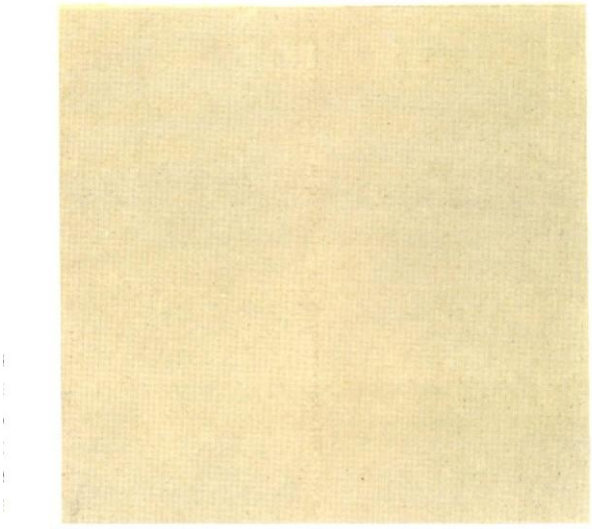
In this puzzle we are going to try to fit the pieces of five polygons into a sixth polygon, the square.
First cut out the Greek cross.
Next, cut along the dotted lines.
Now fit the pieces together so they will exactly cover the square. Do not cut the square in pieces.

When you have learned how to fit the Greek cross pieces into the square, cut out the triangle. Then cut on the dotted lines and fit those pieces into the square.

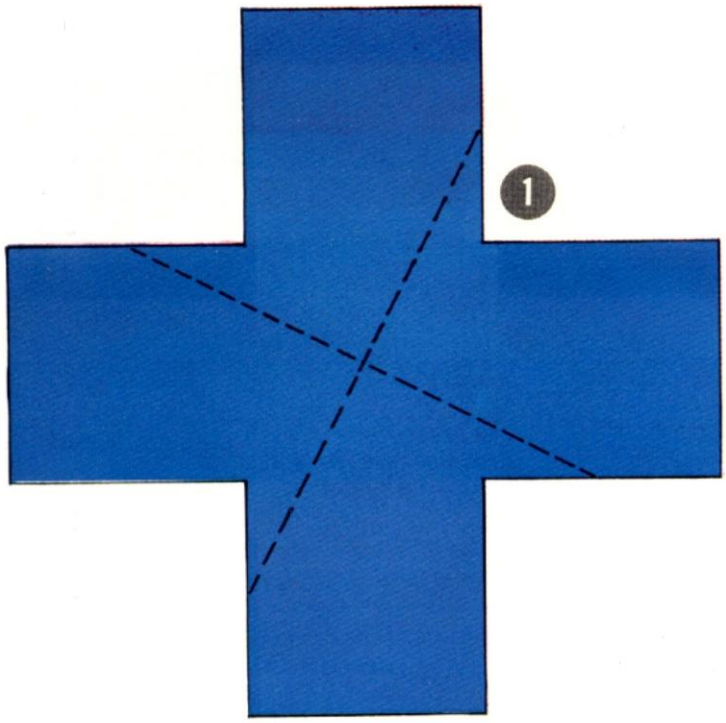
Next try the rectangle, then the parallelogram and the hexagon.
It is not hard to solve these puzzles, but it took very hard work on the part of David Hilbert and other mathematicians to find out how to cut one polygon so that the pieces will fit into another one. If the dotted lines were not there, most of us would not know how to make the cuts, and would not know how many pieces to cut the polygon into. Even now, no one knows what the smallest number of pieces will be in a puzzle of this kind. David was the greatest mathematician of his time, but he himself did not know what the smallest number of pieces would be. To this day no one has found out!

NOTE: I created image files in PAINT and then transferred them to MICROSOFT WORD. The area of the figures may be slightly off, but you can still do the puzzle by cutting the figures apart and putting them together to form a square. You just won't have the square template to work with.

SQUARE



GREEK CROSS



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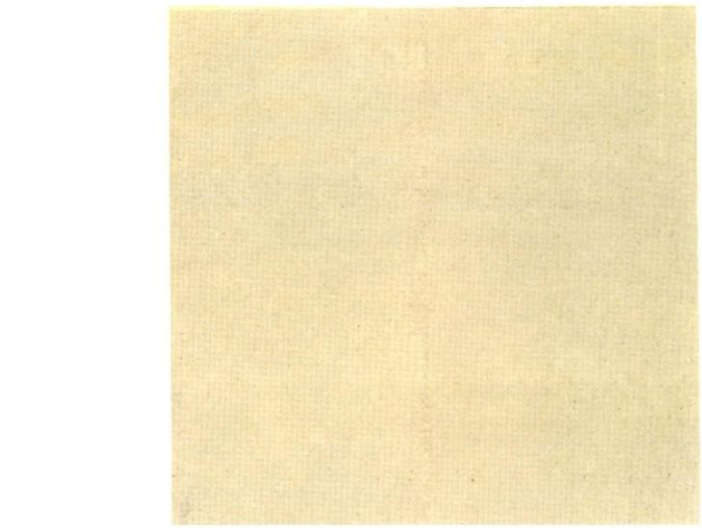
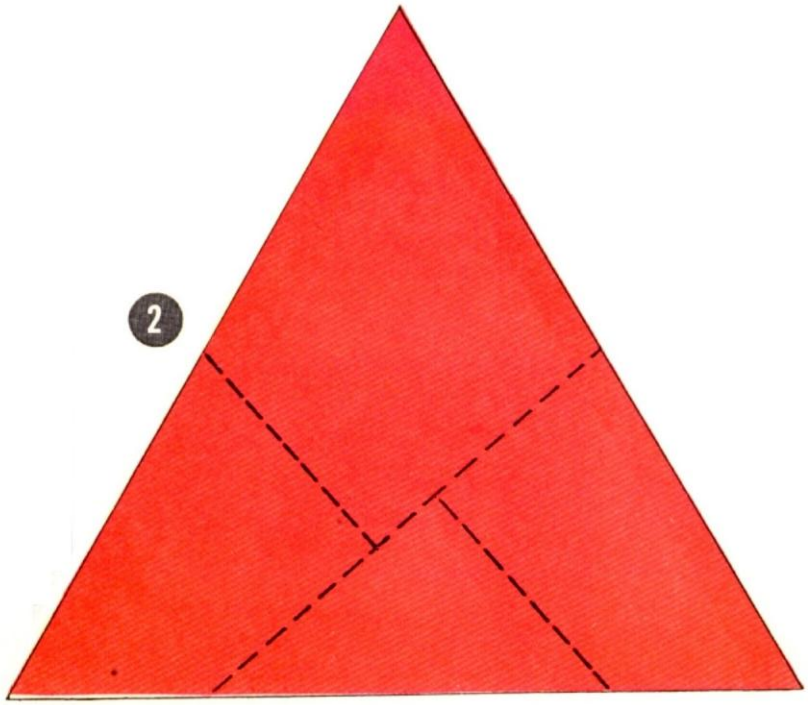
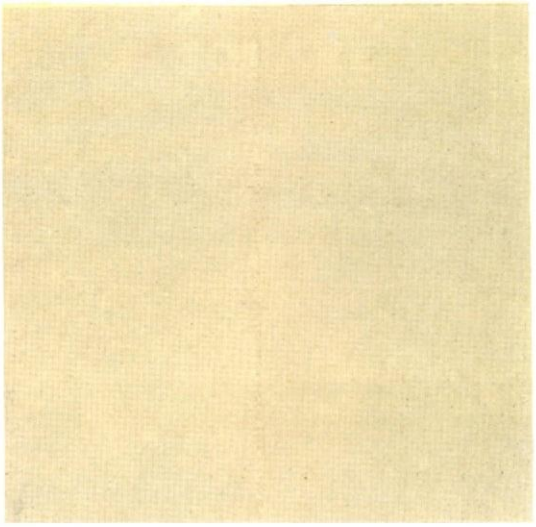




TRIANGLE

SQUARE



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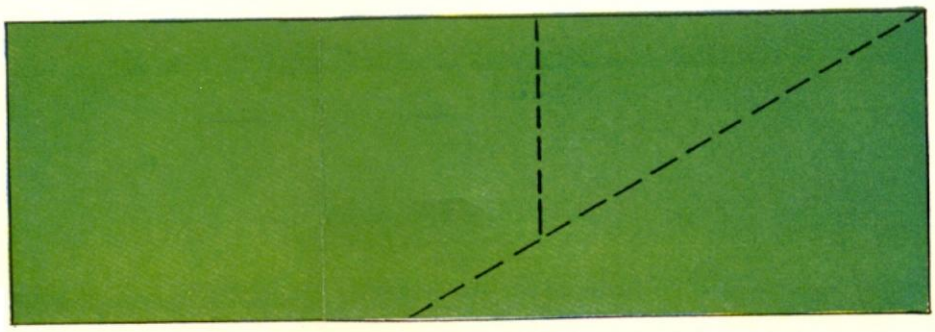
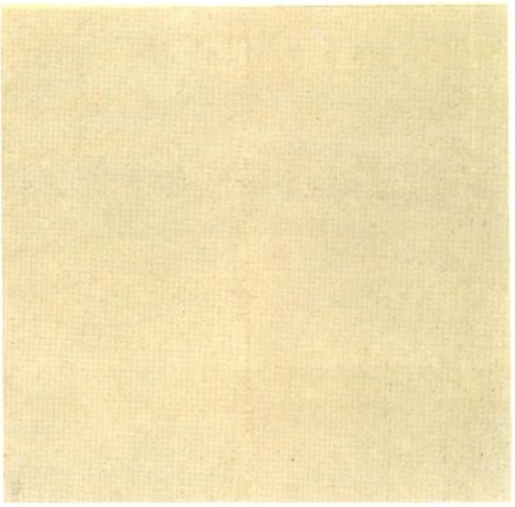
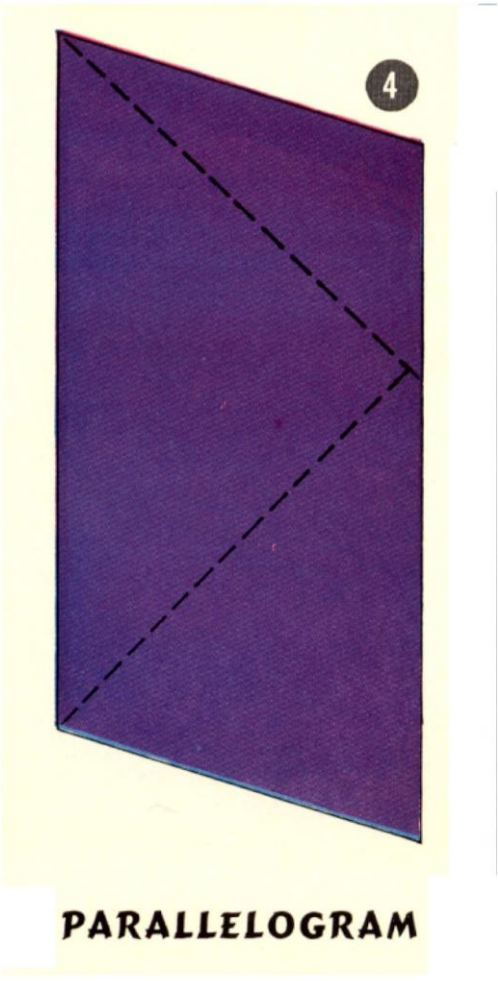


RECTANGLE

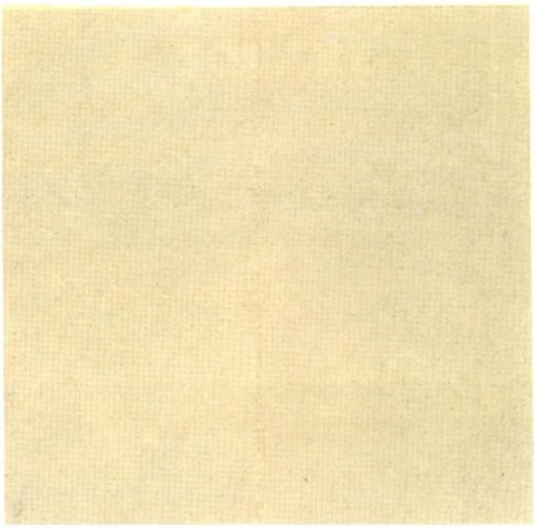
SQUARE





PARALLELOGRAM

SQUARE



HEXAGON

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