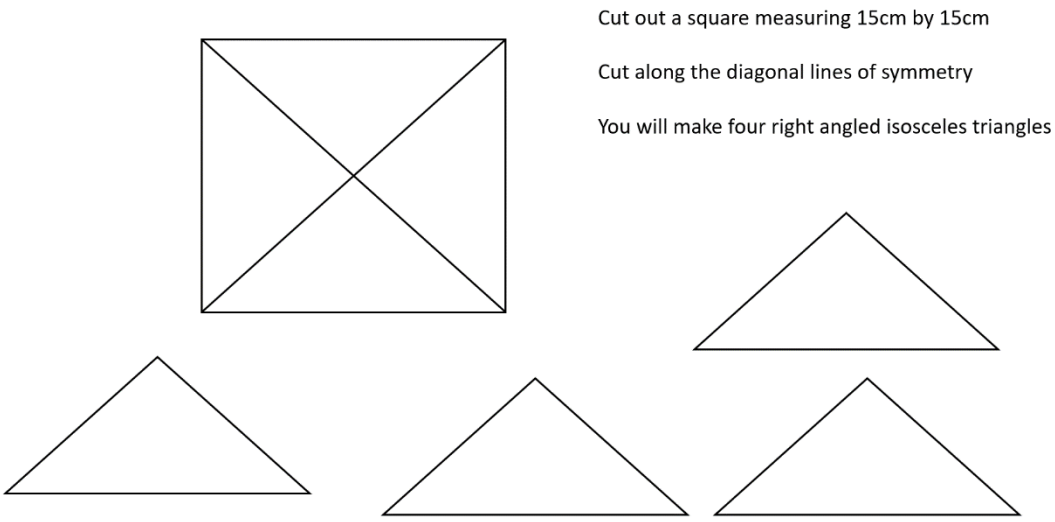
Problem of the Week: Week 1 (Sum1): Year 7: Geometry : with sample solutions

- Apply the properties of angles at a point, angles at a point on a straight line and vertically opposite angles
- Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures

You will need A4 paper, a ruler and a protractor

Squares and Triangles Tangram



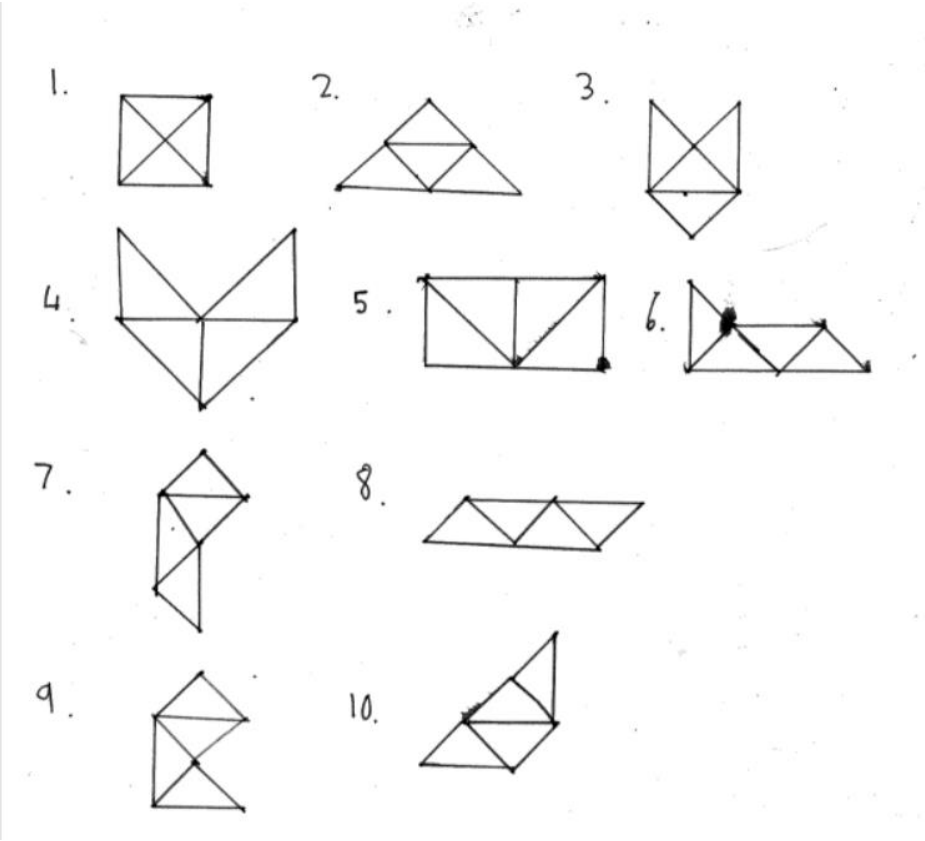
How many different shapes can you make by fitting the four triangles back together?

You may only fit long sides to long sides and short sides to short sides.

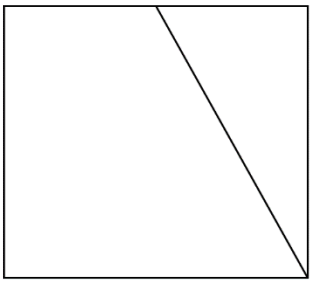
The whole length of the side must be joined.

Record what you do with drawings, descriptions of angles, symmetry and any other properties you notice.

Some Solutions



Two Piece Tangram



Cut out a square measuring 15cm by 15cm

Cut along the line shown to make a right angled triangle and a trapezium

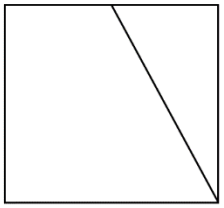
This line is drawn from the mid-point of one side to the opposite corner

How many different shapes can you make by fitting the two shapes back together?

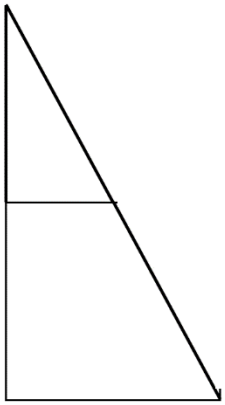
You may only fit long sides to long sides and short sides to short sides.

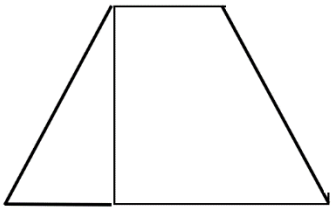
The whole length of the side must be joined.

Record what you do with drawings and descriptions of angles and any other properties you notice.



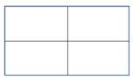
Some solutions

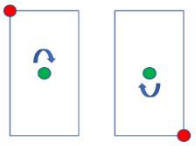




Exploring properties of quadrilaterals

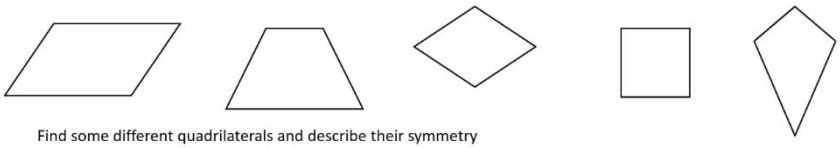
A rectangle has two lines of reflective symmetry





A rectangle has rotational symmetry of order 2

Describe the symmetry of these other quadrilaterals



Find some different quadrilaterals and describe their symmetry

1 2 3 4 5

.1. Parallelogram ~ no reflective symmetry and no rotational symmetry

.2. Isosceles trapezium ~ one line of reflective symmetry and no rotational symmetry

.3. Rhombus ~ two lines of reflective symmetry, rotational symmetry order 2

.4. Square ~ four lines of reflective symmetry, rotational symmetry order 4

.5. Kite ~ one lines of reflective symmetry and no rotational symmetry

(Note that the properties might change if you draw different trapezia, for example)

Reference : https://nrich.maths.org/141

Two Piece Tangram : A great idea from Peter Ransom