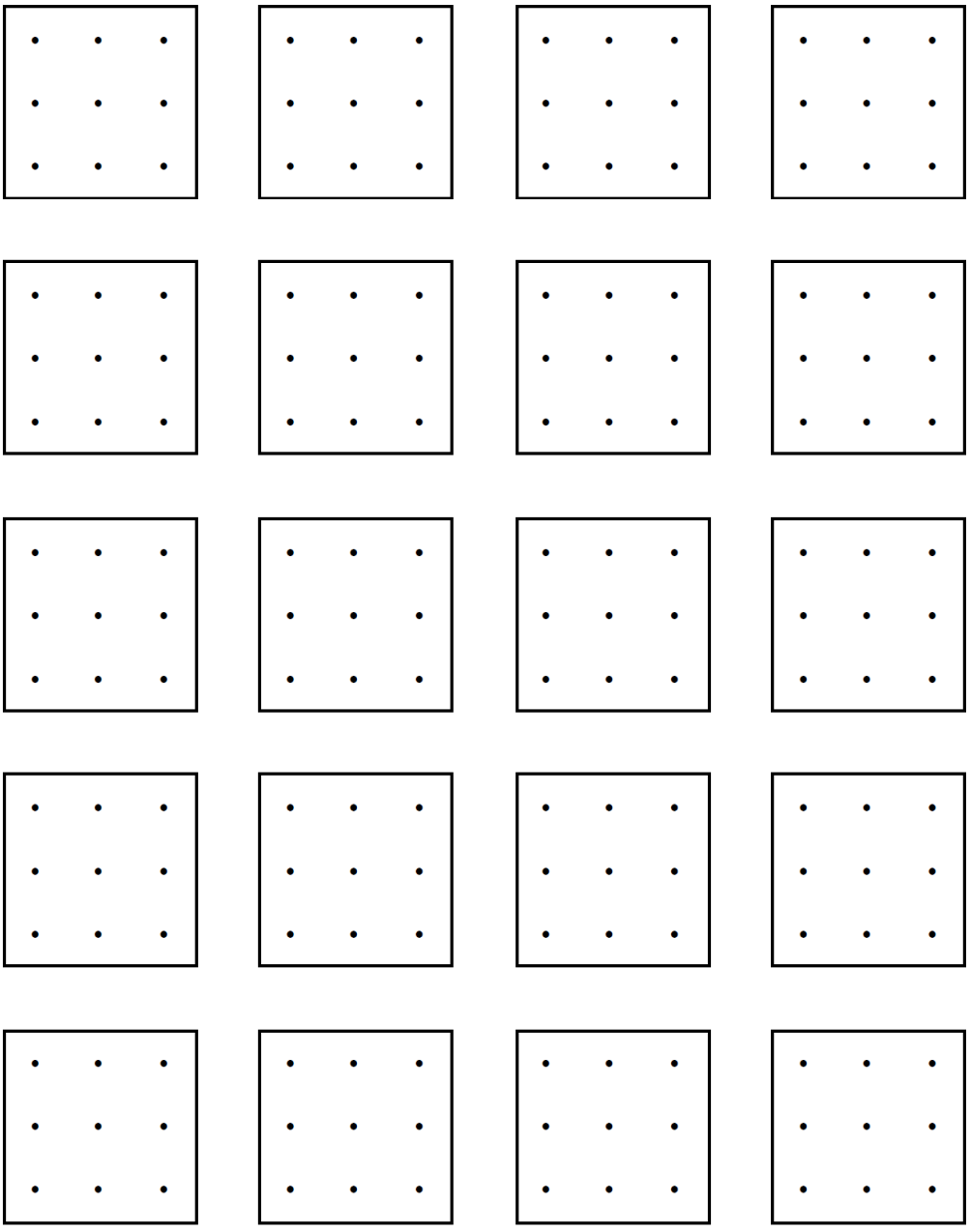
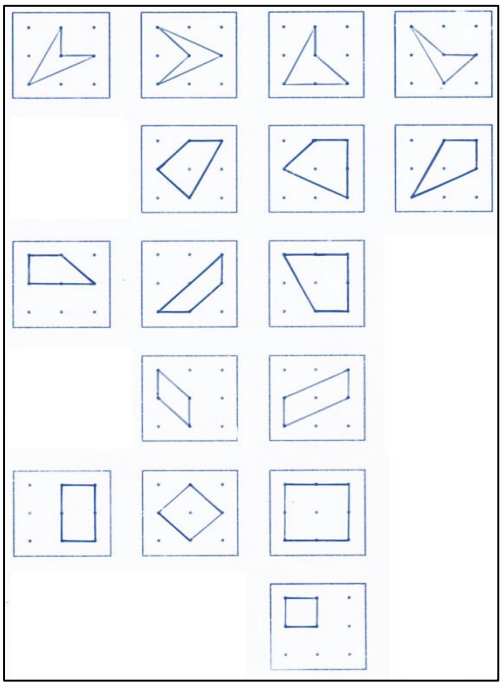
Classification of quadrilaterals

➢ What criteria can we use to classify quadrilaterals?

To improve your knowledge about the classification of quadrilaterals, **try to find out all the possible quadrilaterals** on the 3 x 3 geoboard or the 3 x 3 dotted paper (note that it is not possible to find out all the quadrilaterals that exist on the 3 x 3 geoboard or the 3 x 3 dotted paper).



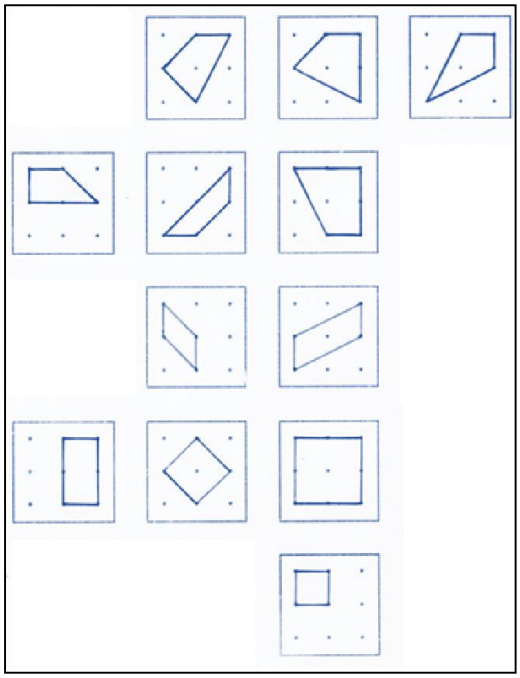
Check to see if you have discovered the following quadrilaterals:



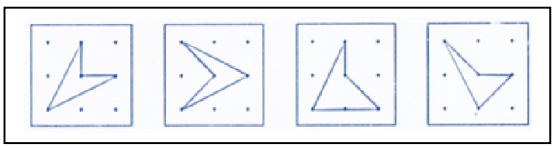
Let's look at possible ranking criteria.

Attending to convexity: a quadrilateral is convex if for any two of its points the line segment joining them is contained in the polygon.

Convex quadrilaterals



Non-convex quadrilaterals

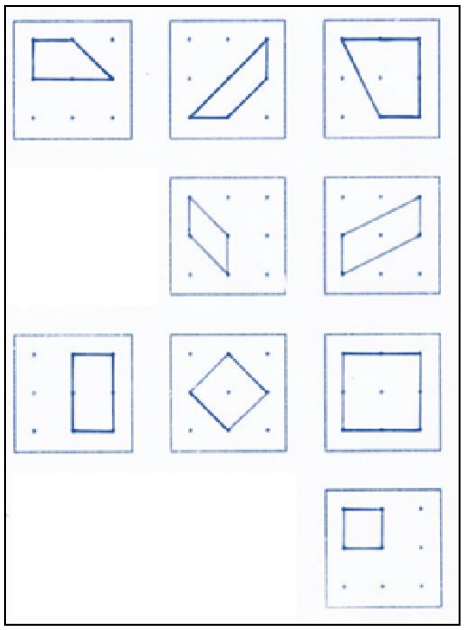


- **Focusing on convex quadrilaterals…**

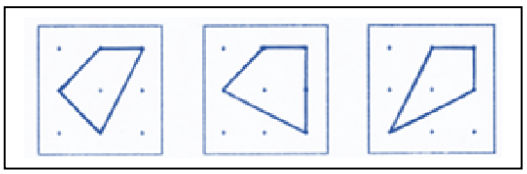
Given the criterion: parallelism of its sides.

We find the quadrilaterals that have at least two parallel sides (trapezoids) and those that do not have parallel sides (non-trapezoids).

Trapezoids



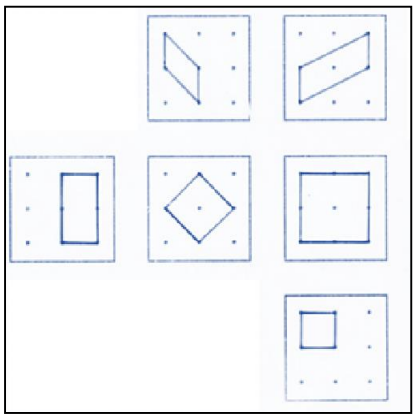
Non-trapezoids



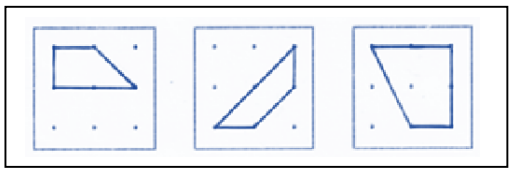
- **Now the focus is on trapezoids**

Also considering the parallelism of their sides, we will find the quadrilaterals that have two pairs of parallel sides (parallelogram trapezoids or simply parallelograms) and those that have only two parallel sides (non-parallelogram trapezoids).

Parallelograms



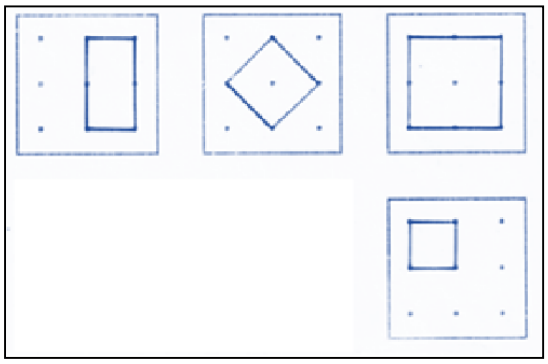
Non-parallelogram trapezoids



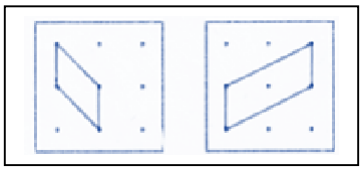
- **Now the focus is on parallelograms**

Given the amplitude of the angles, we find the parallelograms that have all right angles (right-angled parallelograms or simply rectangles) and those that have no right angles (non-rectangles parallelograms).

Rectangle parallelograms



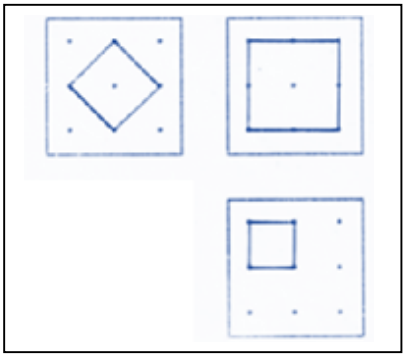
Non-rectangles parallelograms



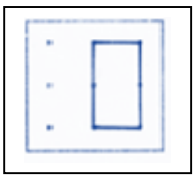
Can we also define some classification criteria for rectangles?

Taking into account the length of the sides, we can consider rectangles with all sides of equal length (squares) or sides with different lengths (non-squares).

Squares



Non-squares



To go further:

Remember that it is not possible to find out all the quadrilaterals that exist on the 3 x 3 geoboard or the 3 x 3 dotted paper.

Try finding quadrilaterals on the 5 x 5 geoboard or the 5 x 5 dotted paper. Can you find a scalene trapezoid? Can you find a rhombus?