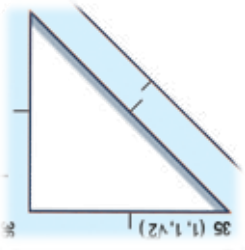
Square

Connecting **triangles** with **quadrilaterals** using Mathomat.

Use Mathomat's right-angled triangles to discover the properties of squares and rectangles.

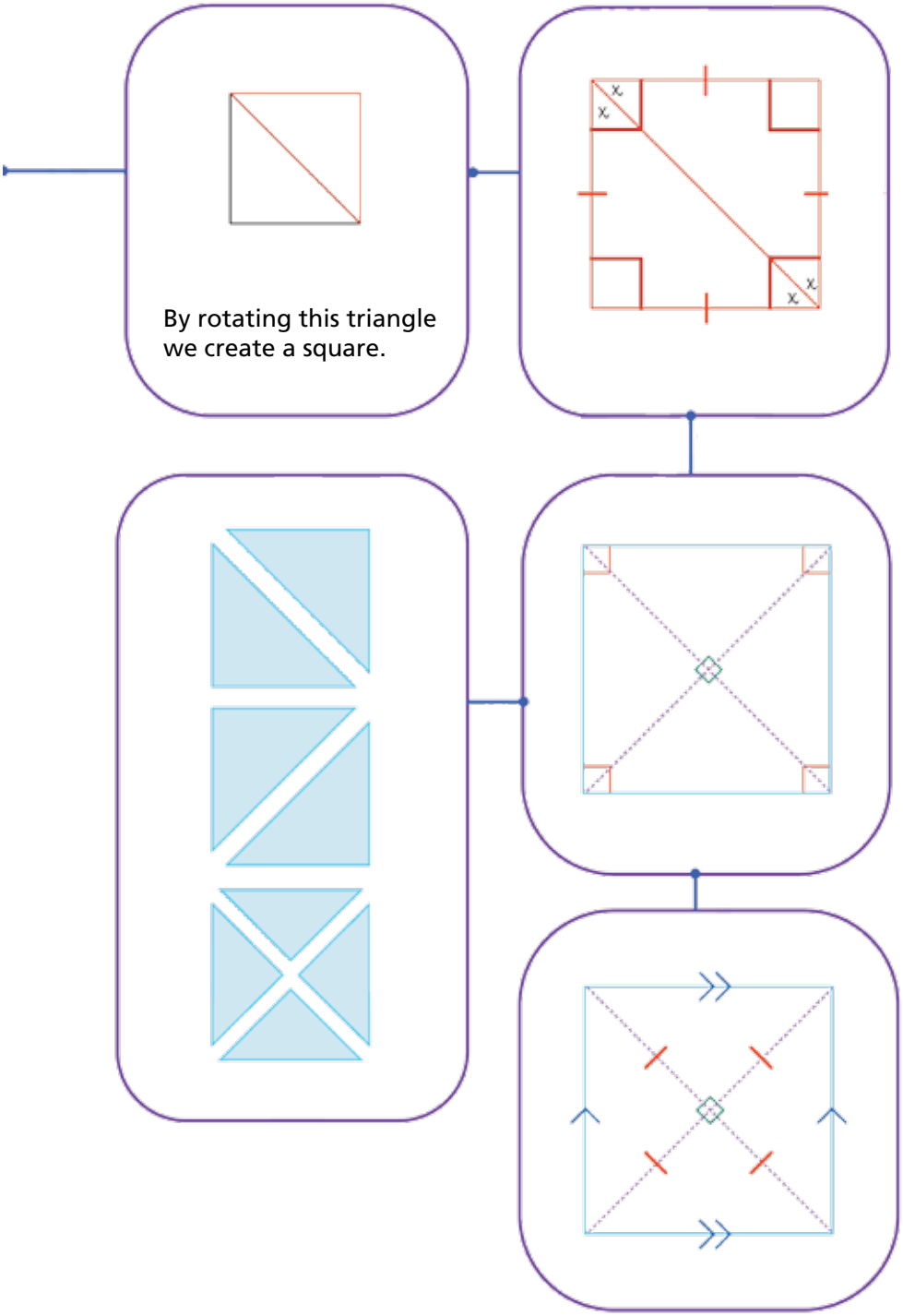


Find the **right-angled isosceles triangle** on Mathomat (shape 35). Draw it, then rotate Mathomat to draw another triangle along its diagonal.

Each diagonal halves the square into two pairs of congruent isosceles right-angled triangles. Both of the diagonals quarters the square into four congruent isosceles right-angled triangles.

Opposite angles and adjacent angles of the square are congruent at 90°.

The diagonals bisect one another perpendicularly. They also bisect the angles. Opposite sides are equal in length.



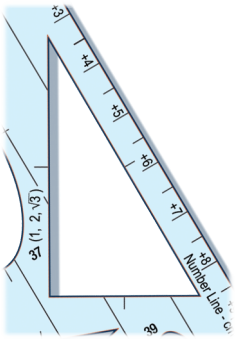
To prove the shape is a square:

show any one of the following:

- The quadrilateral is a parallelogram with a corner angle equal to 90° and a pair of adjacent sides equal.
- The quadrilateral is a rhombus with a corner angle equal to 90°.
- The quadrilateral is a rhombus with equal diagonals.

Rectangle

Connecting **triangles** with **quadrilaterals** using Mathomat.

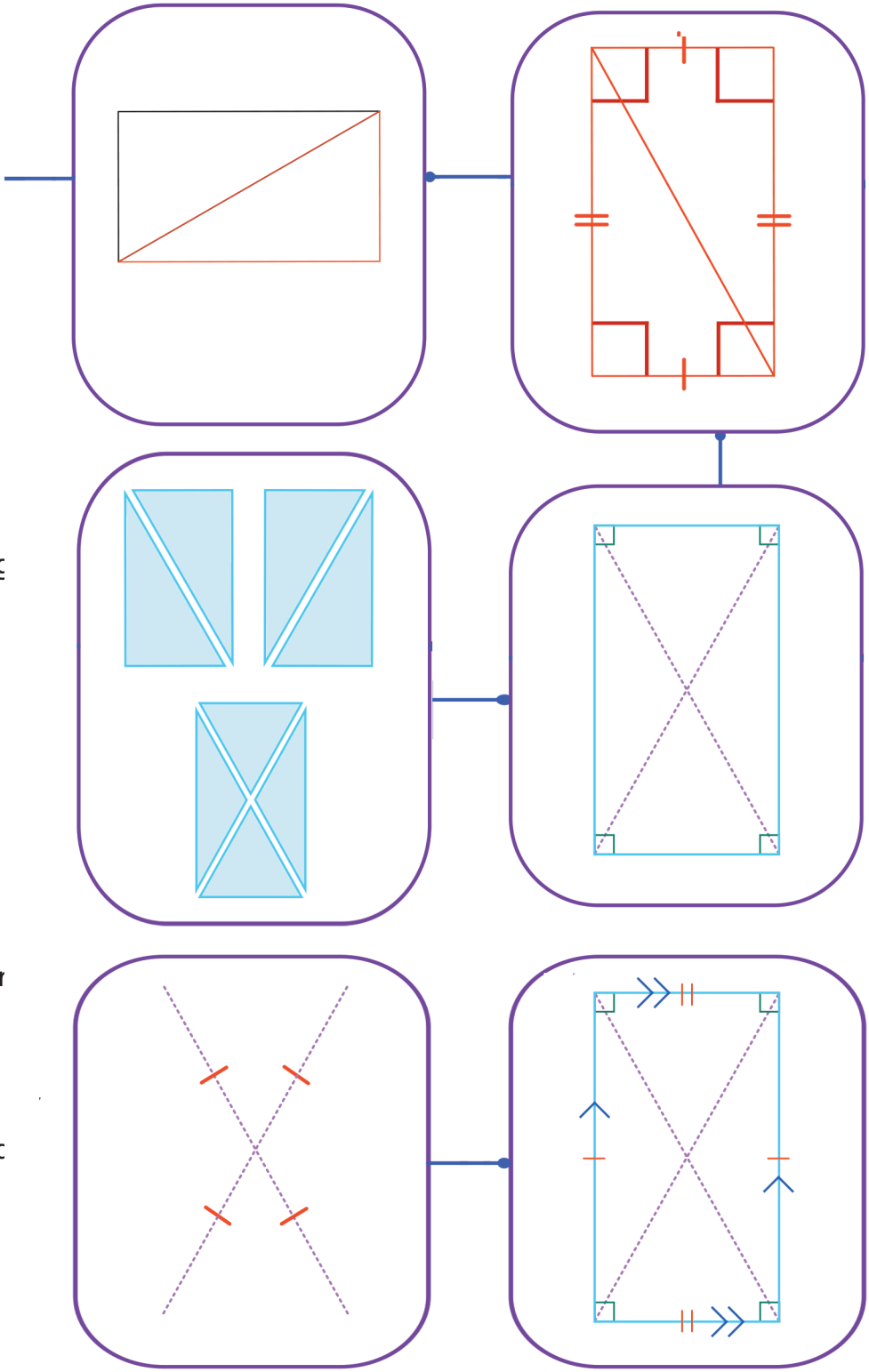


Draw the **right-angled scalene triangle** on Mathomat (shape 37). Rotate the Mathomat to draw another triangle along the hypotenuse.

Each diagonal halves the rectangle into two pairs of congruent scalene right angled triangles.

Both of the diagonals quarters the rectangle into two pairs of congruent isosceles triangles.
Opposite angles and adjacent angles of the rectangle are congruent.

The opposite sides of the rectangle are congruent and parallel, and adjacent sides are perpendicular.
The diagonals bisect one another.
The diagonals do not bisect the angles.



To prove the shape is a rectangle:

show that the quadrilateral is a parallelogram and one of the following:
- The parallelogram has a vertex angle equal to 90°.
- The parallelogram has diagonals that are equal in length.