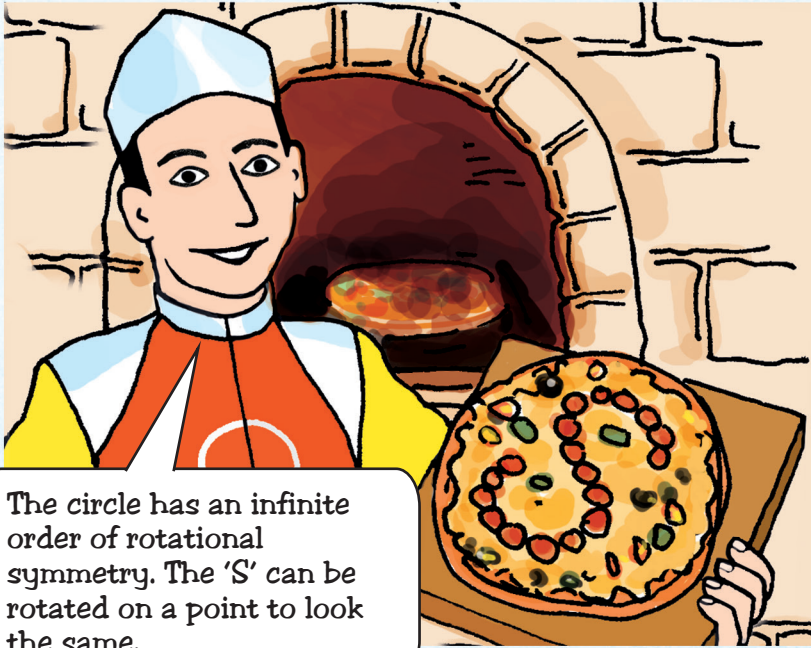


Symmetrical spin



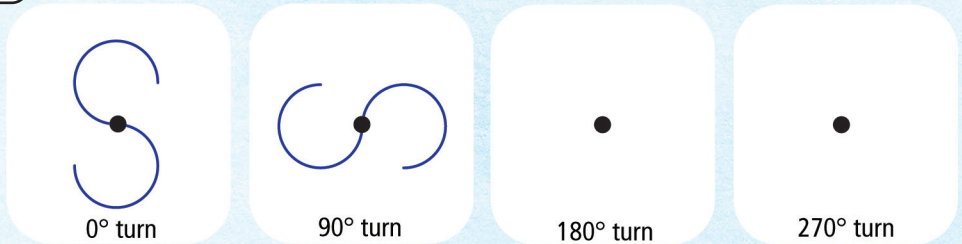
The circle has an infinite order of rotational symmetry. The 'S' can be rotated on a point to look the same.

A figure is symmetrical if we can alter its points in a way that leaves the whole figure unchanged.

The two ways that you can do this are through line symmetry and through rotational symmetry.

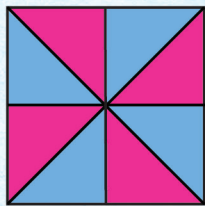
We used line symmetry earlier in the Mr Symmetrical activity. Rotational symmetry leaves a figure unchanged after rotation of its points by a certain angle about a central point.

Make the circle for the S with the 10mm diameter circle on Mathomat and complete the turns with a point of rotation at the centre of the S. Which of these rotations leaves the letter S unchanged?

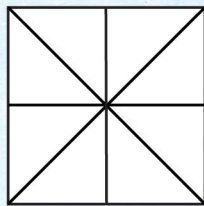


A figure with rotational symmetry of 180° is said to have point symmetry.

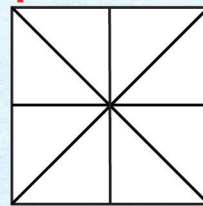
Explore different symmetries with a square



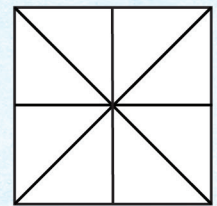
A square has rotational symmetry of order 4: the point of rotation is the centre.



90° turn



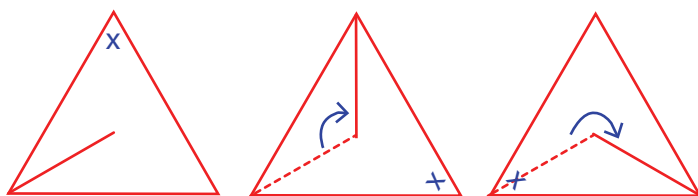
180° turn



270° turn

Colour these squares to represent the rotational symmetries shown.

Equilateral triangles



start

120° rotation

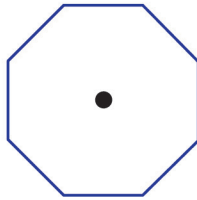
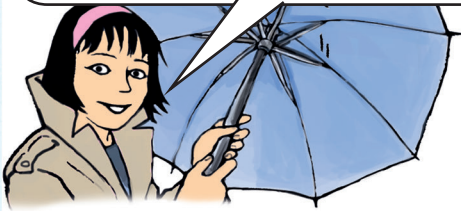
240° rotation

Trace triangle 5 from Mathomat V7 onto scrap paper. Cut it out, mark one corner with an x. Holding the triangle cut-out in place with a pen at its centre turn it twice, each time by 120 degrees to find the three rotational symmetries shown at left.

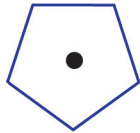
Equilateral triangles have three rotational symmetries, or rotational symmetry of order 3.

Find the shapes on the Mathomat

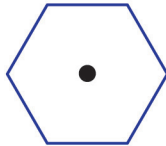
My umbrella has 8 sections. It has rotational symmetry of order 8.



Rotational symmetry of order.....

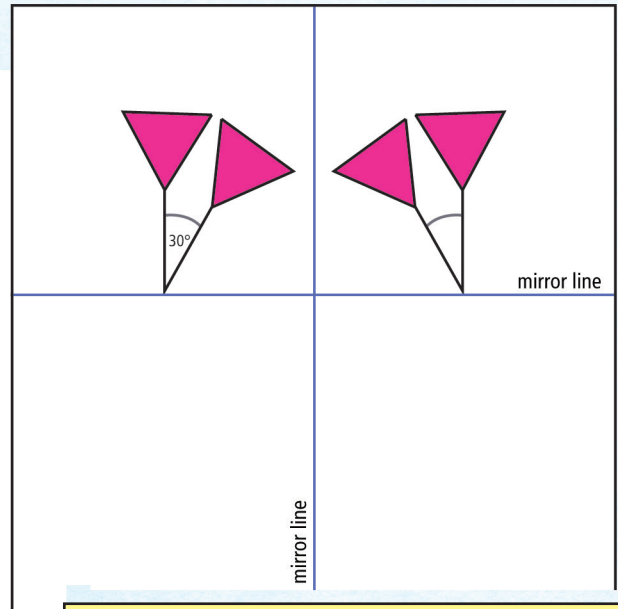


Rotational symmetry of order.....



Rotational symmetry of order.....

How many ways can these shapes be turned on a point and look the same?



Draw the missing reflections of these equilateral triangles, exploring rotation and line symmetry.

Create the Robot Head maze

Start

Fill in the missing rotations. You can only move vertically or horizontally.



This puzzle needs completing. To move to the next head the rotation must be 60° clockwise.

Finish

What is the order of rotational symmetry for the head?