

# Rotational Symmetry

Learning Objective: To understand rotational symmetry and to find the order of rotation.

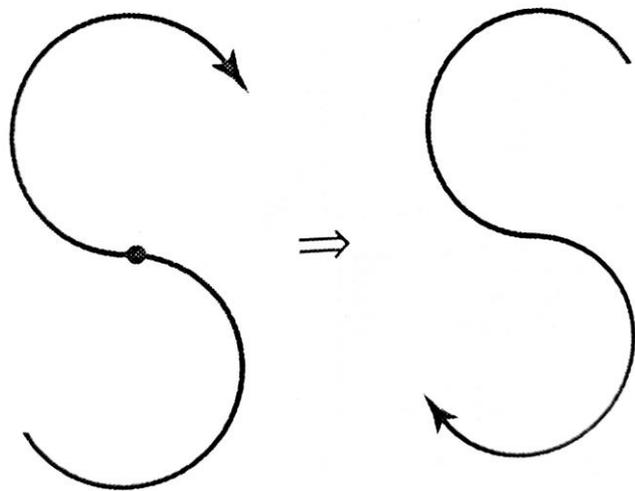
Please complete all work in your maths books, take a photo and put it in the folder that you have shared with your teacher.

If a shape can fit exactly onto itself after a certain rotation (not a full rotation), then it is said to have rotational symmetry. The number of times it can fit exactly onto itself in one full revolution is called the “order of rotational symmetry”.

Important: A full rotation doesn't mean that a shape has rotational symmetry

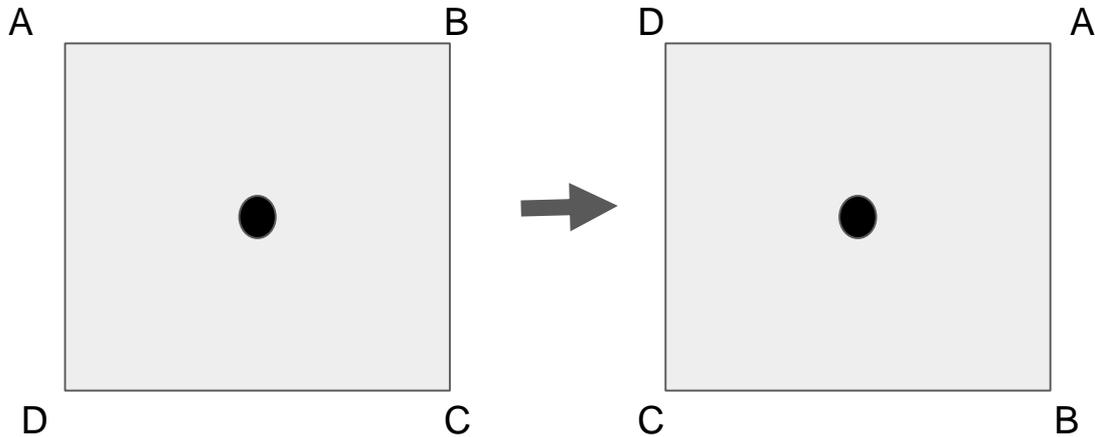
Watch the video below to learn about rotational symmetry

<https://www.youtube.com/watch?v=ZgEnz-TAzmg>

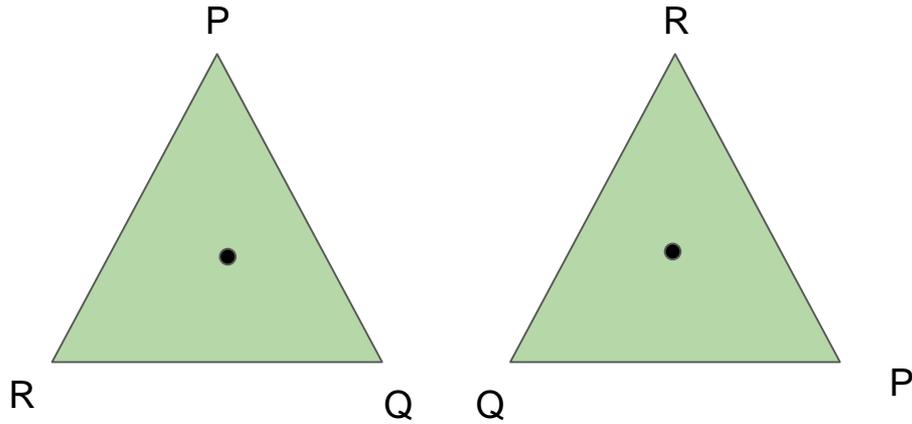


The letter S has rotational symmetry because it can fit exactly onto itself after half a turn ( $180^\circ$ ).

The letter S has rotational symmetry of order 2, because it can fit exactly onto itself twice.



A square has rotational symmetry because it can fit exactly onto itself after  $\frac{1}{4}$  of a turn ( $90^\circ$ ). The square has rotational symmetry of order 4, because it can fit exactly onto itself 4 times.



An equilateral triangle (all sides equal) has rotational symmetry because it can fit exactly onto itself after  $\frac{1}{3}$  of a turn ( $120^\circ$ ).

This triangle has rotational symmetry of order 3, because it can fit exactly onto itself 3 times.

Which of these shapes have rotational symmetry?

Complete this work in your book

A H N T Z X

Hint: Draw each letter on a piece of paper, cut it out and rotate it around the middle point

Solution: The letters H, N, Z and x have rotational symmetry because if you rotate them through a half revolution ( $180^\circ$ ) they will look exactly the same.

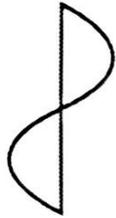
H N Z X

# Enabler

Which of the following shapes have rotational symmetry?

Hint: Draw each shape on a piece of paper, cut it out and rotate it around the middle point

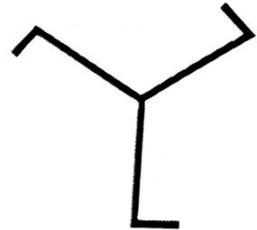
(a)



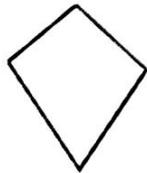
(b)



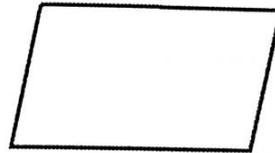
(c)



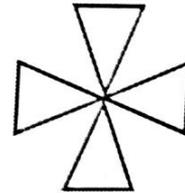
(d)



(e)



(f)



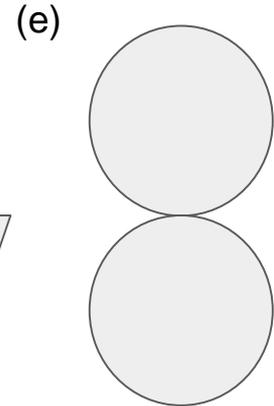
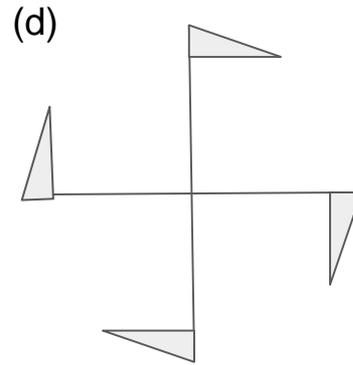
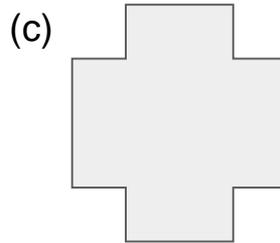
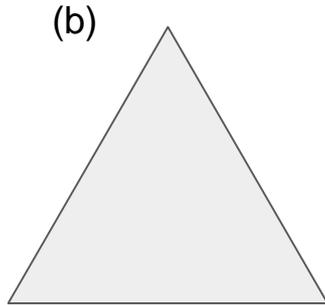
Have a go at the following game to extend your skills

<https://www.studyladder.com.au/games/activity/rotational-symmetry-symbols-36511?backUrl=/games/mathematics/au-year-five/mathematics-location-and-transformation-1732?q=rotational%20symmetry>

# Core

The following figures have rotational symmetry. Give the order of rotational symmetry for each.

Hint: Draw each shape on a piece of paper, cut it out and rotate it around the middle point



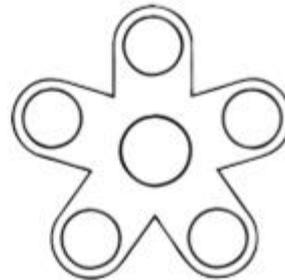
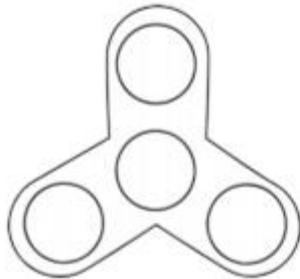
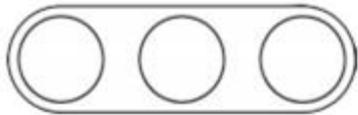
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# Extender

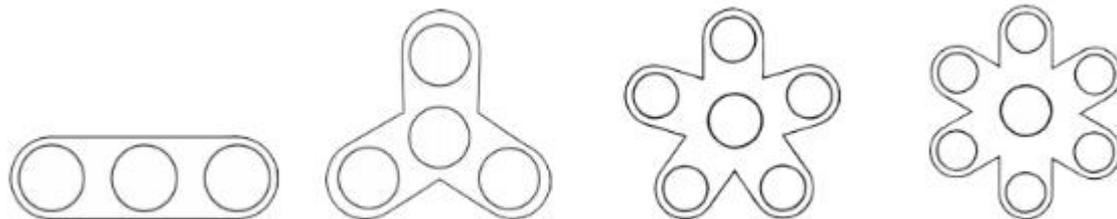
Hint: Draw each shape on a piece of paper, cut it out and rotate it around the middle point

Now look at each of the fidget spinners below and decide if they have rotational symmetry. If so, next to each image write how many orders of rotational symmetry each fidget spinner has.



# Extender

Hint: Draw each shape on a piece of paper, cut it out and rotate it around the middle point



## Section 2

Next, work out the following:

The 2-branch fidget spinner turns \_\_\_\_\_° to make each order of rotational symmetry.

The 3-branch fidget spinner turns \_\_\_\_\_° to make each order of rotational symmetry.

The 5-branch fidget spinner turns \_\_\_\_\_° to make each order of rotational symmetry.

The 6-branch fidget spinner turns \_\_\_\_\_° to make each order of rotational symmetry.

Have a go at the following game to extend your skills

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