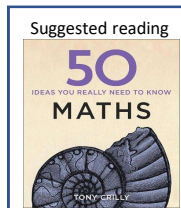


# Year 9 – Reasoning with Geometry

## Rotation & Translation



Want to know more?  
Scan the QR code to visit the curriculum overview for Year 9 Maths, including topic summaries, key words, and books that you may want to read in your own time



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### What do I need to be able to do?

By the end of this unit you should be able to:

- Identify the order of rotational symmetry
- Rotate a shape about a point on the shape
- Rotate a shape about a point not on a shape
- Translate by a given vector
- Compare rotations and reflections

### Keywords

**Rotate:** a rotation is a circular movement

**Symmetry:** when two or more parts are identical after a transformation

**Regular:** a regular shape has angles and sides of equal lengths

**Invariant:** a point that does not move after a transformation

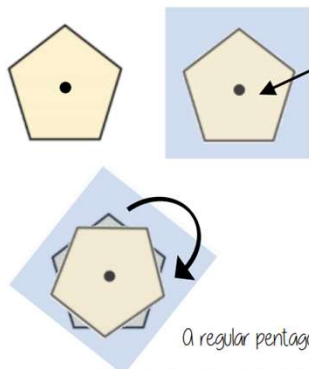
**Vertex:** a point two edges meet

**Horizontal:** from side to side

**Vertical:** from up to down

### Rotational Symmetry

Tracing paper helps check rotational symmetry



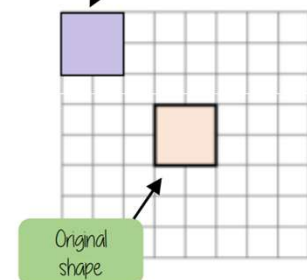
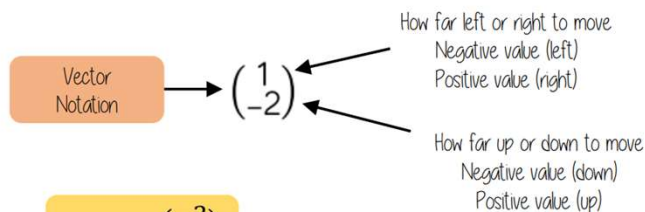
1 Trace your shape (mark the centre point)

2 Rotate your tracing paper on top of the original through 360°

3 Count the times it fits back into itself

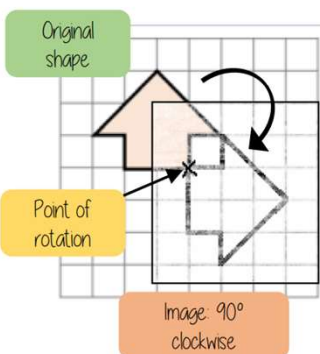
A regular pentagon has rotational symmetry of order 5

### Translation and vector notation



Every vertex has been translated by the same amount

### Rotate from a point (in a shape)



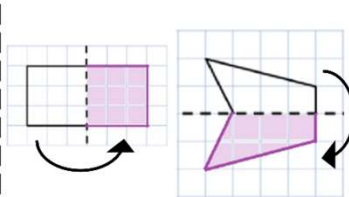
1 Trace the original shape (mark the point of rotation)

2 Keep the point in the same place and turn the tracing paper

3 Draw the new shape



### Compare rotations and reflections

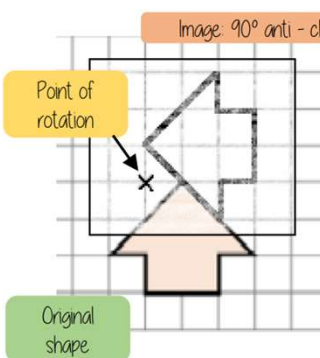


**R** Reflections are a mirror image of the original shape

Information needed to perform a reflection:

- Line of reflection (Mirror line)

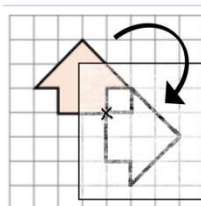
### Rotate from a point (outside a shape)



1 Trace the original shape (mark the point of rotation)

2 Keep the point in the same place and turn the tracing paper

3 Draw the new shape



Rotations are the movement of a shape in a circular motion

Information needed to perform a rotation:

- Point of rotation
- Direction of rotation
- Degrees of rotation