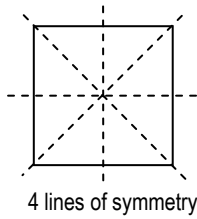
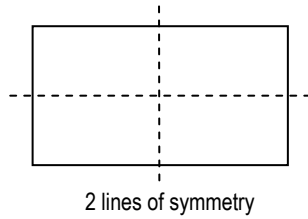


Recognise Lines of Symmetry & Calculate Orders of Rotational Symmetry (iss4)

Check out the 'EXTRA: Symmetry of Shapes' on iSS2 before beginning this page!



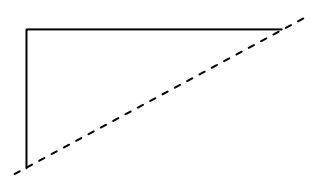
4 lines of symmetry



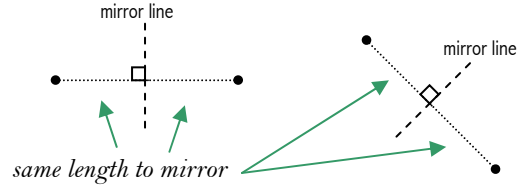
2 lines of symmetry

Your Turn!!

a) Notice the diagonals of the rectangle are not lines of symmetry of a rectangle. If these two sides of a rectangle are reflected then what shape results?



Hint a): Remember how a mirror works. Any point one side of the mirror appears the **same distance** at the other side of the mirror and at **right-angles** through the mirror. Also, to reflect any shape, first reflect the end points of each line in the shape.



Your Turn!!

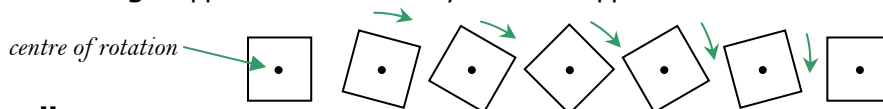
b) Copy this table and complete the *number of lines of symmetry* column. **Hint:** In a similar way as the rectangle above consider carefully whether the diagonals of the shape are true mirror lines.

Name of Shape	No of lines of Symmetry	Order of Rotational Symmetry
square	4	4
rectangle	2	
parallelogram		
irregular quadrilateral		
kite		
rhombus		
trapezium		

To work out the **order of rotational symmetry** of a shape ask:

How many times does the shape appear the same when rotated through 360°?

When rotated about its centre a **square** looks the same every 90° and so in a rotation of 360° appears the same 4 times. A **rectangle** appears the same every 180° - so appears the same twice.



Your Turn!!

c) Ask yourself this question, "How many times does the shape appear the same when rotated through 360°?" for the other shapes and complete the 3rd column of the table above. **Hint:** All shapes must have an order of rotational symmetry of 1 or more, because all shapes look the same once they have been rotated through the full 360°. Shapes that are said to **have rotational symmetry** must therefore have an order of rotational symmetry greater than 1!!

Your Turn!!

d) Is it possible to have a trapezium with one line of symmetry? Yes it is called an isosceles trapezium. You can make one by chopping off an isosceles triangle – Chop the two sides that are the same length.
i) Draw an isosceles trapezium showing the line of symmetry. ii) What is its order of rotational symmetry?

Regular Polygons

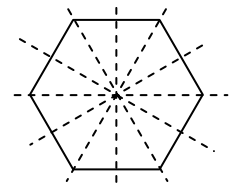
Spot the Pattern...

The number of lines of symmetry of a regular 6-sided shape is 6 and it also has order of rotational symmetry 6. The number of lines of symmetry of a regular 7-sided shape is 7 and it also has order of rotational symmetry 7.

Your Turn!!

e) How many lines of symmetry does a regular 8 sided polygon have?
f) What is the order of rotational symmetry of a regular 8 sided polygon?

The 6 lines of symmetry for a regular 6-sided shape – regular hexagon – are shown here. Also note that the shape will appear the same every $\frac{1}{6}$ th of a rotation and so appears the same 6 times when rotated through 360°.



RAPID 'ACID' TEST – Blank out the page above before answering these!

1. i) How many lines of symmetry do the following shapes have? ii) State their order of rotational symmetry.
a) square b) rectangle c) kite d) parallelogram e) regular 5-sided polygon