

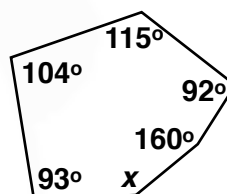
Symmetry (Reflection and Rotational)

Starter

1. **(Review of last lesson)** A regular polygon has 17 sides. Calculate the size of one interior angle. Give your answers to 1 d.p.

Working: Exterior angle = $\frac{360^\circ}{17} = 21.17^\circ$ (2 d.p.)
 Interior angle = $180^\circ - 21.17^\circ = 158.8^\circ$ (1 d.p.)

2. **(Review of last lesson)**
 Calculate the value of x .



Working: The polygon has 6 sides.
 Sum of the interior angles = $180^\circ(6 - 2) = 720^\circ$
 $x = 720^\circ - 93^\circ - 104^\circ - 115^\circ - 92^\circ - 160^\circ = 156^\circ$

3. State the number of lines of symmetry of:
 (a) a square (b) a rectangle (c) an isosceles triangle

Working: (a) 4 (b) 2 (c) 1

E.g. 1 Geogebra 1: [Finding the line of symmetry](#) (10 questions)

Working: The red line will go green when you are correct.

E.g. 2 Geogebra 2: [Rotating a line to find the lines symmetry](#) (14 questions)

Explanation: [Lines of symmetry](#)

E.g. 3 Geogebra 4: [Rotational symmetry of regular polygons](#)

Write down the smallest angle which each regular polygon must rotate through to be on itself. In addition, write down the order of rotational symmetry.

- (a) Equilateral triangle (b) Square
 (c) Regular pentagon (d) Regular hexagon

What is the connection between the smallest angle the regular polygon must rotate through and its order of rotational symmetry?

Working: (a) 120° , order of rotational symmetry = 3
 (b) 90° , order of rotational symmetry = 4
 (c) 72° , order of rotational symmetry = 5
 (d) 60° , order of rotational symmetry = 6
 If we divide 360° by the smallest angle, we get the order of rotational symmetry.

E.g. 4 Geogebra 5: Rotational symmetry of quadrilaterals

Write down the order of rotational symmetry for these quadrilaterals:

- | | | |
|-------------------|---------------|-------------|
| (a) Square | (b) Rectangle | (c) Rhombus |
| (d) Parallelogram | (e) Trapezium | (f) Kite |

Working:

(a)	4	(b)	2	(c)	2
(d)	2	(e) & (f)	No rotational symmetry		

E.g. 5 Geogebra 6: Rotational symmetry of strange shapes

Write down the order of rotational symmetry for the 12 shapes.

Working:

Figure 1	Order of rotational symmetry = 5
Figure 2	No rotational symmetry
Figure 3	Order of rotational symmetry = 6
Figure 4	No rotational symmetry
Figure 5	Order of rotational symmetry = 2 (ignoring the laces)
Figure 6	No rotational symmetry
Figure 7	No rotational symmetry
Figure 8	Order of rotational symmetry = 2
Figure 9	Order of rotational symmetry = 4 (ignoring the letters)
Figure 10	Order of rotational symmetry = 3
Figure 11	Order of rotational symmetry = 8
Figure 12	Order of rotational symmetry = 3

Geogebra 7: Rotational and reflective symmetry

Explanation: Rotational symmetry

Video: Reflective symmetry

Video: Rotational symmetry

[Solutions to Starter and E.g.s](#)

Exercise

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CIMT Activity 15.2 Lines of Symmetry (you will need to scroll down to find the activity)

[Textbook answers \(only available during a lockdown\)](#)