

Notes & Steps



Key idea

A shape has rotational symmetry if it can be rotated (less than 360°) around a centre point to fit exactly onto itself. The order of rotational symmetry is how many times it matches in one full 360° rotation. For a regular n -gon, the order is n .

Steps

1. Find the centre of the shape.
2. Rotate the shape mentally. How many different positions look identical?
3. Count each position (including the starting position) – that's the order.
4. Angle of rotation: $360^\circ \div \text{order}$.

Quick reference

- ▶ Square: order 4, angle 90°
- ▶ Rectangle: order 2, angle 180°
- ▶ Regular triangle: order 3, angle 120°
- ▶ Parallelogram: order 2, angle 180°
- ▶ Regular pentagon: order 5, angle 72°
- ▶ Regular hexagon: order 6, angle 60°
- ▶ Circle: infinite order
- ▶ Scalene triangle: order 1 (no rotational symmetry)
- ▶ Isosceles triangle: order 1 (no rotational symmetry)

Common mistake

Counting only positions after rotation, not including the starting position. If a shape looks the same in 3 different rotated positions, that means order 3 (starting + 2 others).

Notes & Steps



Example 1: square

A square matches itself when rotated 90° , 180° , 270° , and 360° (back to start). That's 4 positions: order of rotational symmetry = 4.

Example 2: rectangle

A rectangle (not square) matches at 180° and 360° . Order of rotational symmetry = 2.

Example 3: letter H

The letter H looks the same when rotated 180° but not 90° or 270° . Order of rotational symmetry = 2.

Example 4: regular pentagon

A regular pentagon matches at 72° , 144° , 216° , 288° , and 360° . That's 5 positions: order = 5.

Try these

1. Order of rotational symmetry for a regular octagon?
2. Order for a regular triangle?
3. What is the angle of rotation for a shape with order 5?

Common mistake

Confusing lines of symmetry with rotational symmetry. A rectangle has 2 lines of symmetry and order 2 rotational symmetry. They are related but different concepts.