

Name _____

Date _____

8.3 Symmetry — worksheet

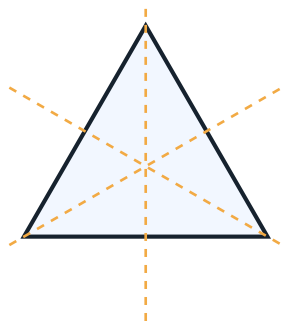
Identify line symmetry and rotational symmetry in 2D shapes, and state the order of rotational symmetry. · 52 questions · Show your working.

Remember

- A **line of symmetry** is a fold line: the two halves match exactly.
- The **order of rotational symmetry** is how many times a shape looks the same in one full turn.
- The smallest turn that works is $360 \div \text{order}$.
- The smallest possible order is **1**, not 0 — every shape returns to itself after a full turn.
- A **regular n-gon** has exactly **n lines of symmetry** and order **n**.
- The two kinds of symmetry are independent: a parallelogram has **no lines** but order **2**.
- A circle has infinitely many lines and infinite order.
- Check a fold line by imagining the paper folded — “it looks about right” is not enough.

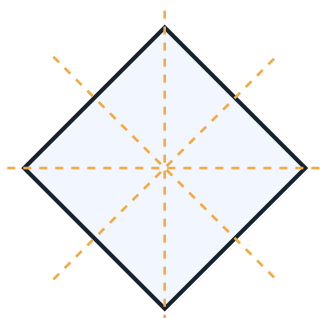
A · Fluency — Count the lines and the order.

- 1 How many lines of symmetry does a **equilateral triangle** have?



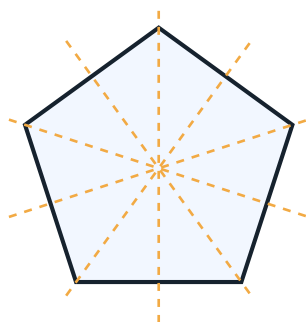
equilateral triangle

- 2 How many lines of symmetry does a **square** have?



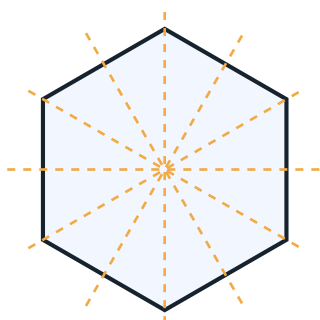
square

- 3 How many lines of symmetry does a **regular pentagon** have?



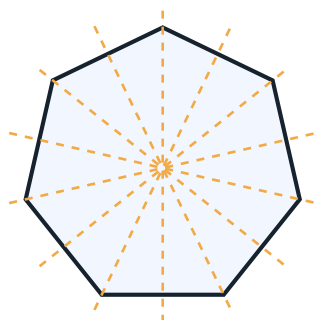
regular pentagon

- 4 How many lines of symmetry does a **regular hexagon** have?



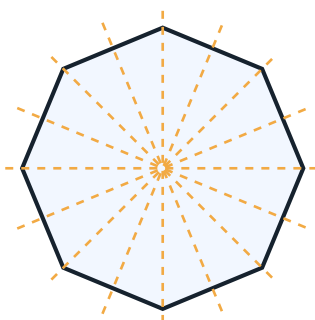
regular hexagon

- 5 How many lines of symmetry does a **regular heptagon** have?



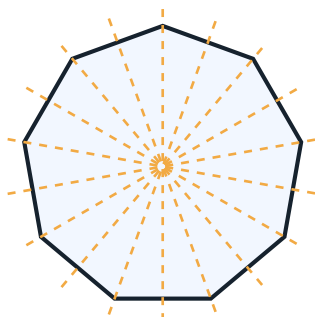
regular heptagon

- 6 How many lines of symmetry does a **regular octagon** have?



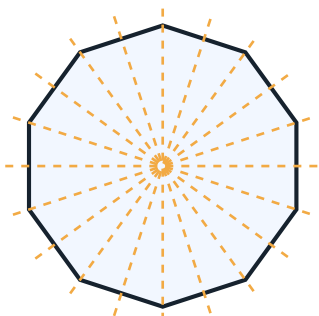
regular octagon

- 7 How many lines of symmetry does a **regular nonagon** have?



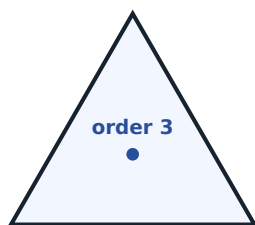
regular nonagon

- 8 How many lines of symmetry does a **regular decagon** have?



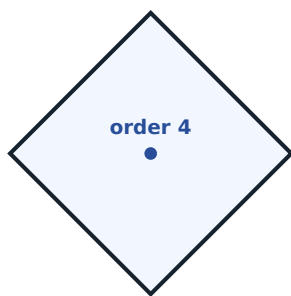
regular decagon

- 9 What is the order of rotational symmetry of a **equilateral triangle**?



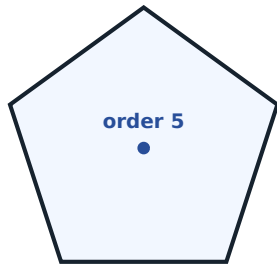
equilateral triangle

- 10 What is the order of rotational symmetry of a **square**?



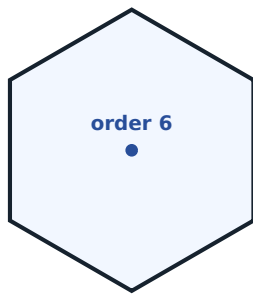
square

- 11 What is the order of rotational symmetry of a **regular pentagon**?



regular pentagon

- 12 What is the order of rotational symmetry of a **regular hexagon**?



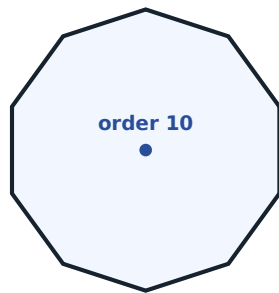
regular hexagon

- 13 What is the order of rotational symmetry of a **regular octagon**?



regular octagon

- 14 What is the order of rotational symmetry of a **regular decagon**?



regular decagon

-
- 15 How many lines of symmetry does a **rectangle** have?
-
- 16 What is the order of rotational symmetry of a **rectangle**?
-
- 17 How many lines of symmetry does a **rhombus** have?
-
- 18 What is the order of rotational symmetry of a **rhombus**?
-
- 19 How many lines of symmetry does a **parallelogram** have?
-
- 20 What is the order of rotational symmetry of a **parallelogram**?
-
- 21 How many lines of symmetry does a **kite** have?
-
- 22 What is the order of rotational symmetry of a **kite**?
-
- 23 How many lines of symmetry does a **isosceles triangle** have?
-
- 24 What is the order of rotational symmetry of a **isosceles triangle**?
-
- 25 How many lines of symmetry does a **scalene triangle** have?
-
- 26 What is the order of rotational symmetry of a **scalene triangle**?
-
- 27 How many lines of symmetry does a **trapezium** have?
-
- 28 What is the order of rotational symmetry of a **trapezium**?
-
- 29 How many lines of symmetry does a **isosceles trapezium** have?
-
- 30 What is the order of rotational symmetry of a **isosceles trapezium**?
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B · Reasoning — What the two kinds mean.

- 31** What is a line of symmetry?
- ☐ A line through the middle
 - ☐ A line where the shape folds exactly onto itself
 - ☐ A diagonal
 - ☐ A line of any length
- 32** What does “order of rotational symmetry 4” mean?
- ☐ It has 4 sides
 - ☐ It looks the same 4 times in a full turn
 - ☐ It has 4 lines of symmetry
 - ☐ It can be turned 4°
- 33** What is the smallest possible order of rotational symmetry?
- ☐ 0
 - ☐ 1
 - ☐ 2
 - ☐ 4
- 34** A parallelogram has no lines of symmetry but order 2. What does that show?
- ☐ It has no symmetry
 - ☐ Line symmetry and rotational symmetry are separate properties
 - ☐ It is not a polygon
 - ☐ The order must be wrong
- 35** Does a regular polygon always have as many lines of symmetry as sides?
- ☐ Yes
 - ☐ No
- 36** Does every shape with rotational symmetry also have line symmetry?
- ☐ Yes
 - ☐ No
- 37** Through what angle must a shape of order 5 be turned to map onto itself?
- ☐ 36°
 - ☐ 60°
 - ☐ 72°
 - ☐ 90°
- 38** A shape has order of rotational symmetry 6. Through what angle is the smallest turn?
- ☐ 30°
 - ☐ 60°
 - ☐ 72°
 - ☐ 90°

C · Challenge — Working back from the turn.

- 39** A regular polygon has 9 lines of symmetry. How many sides has it?
-
-
- 40** A shape maps onto itself every 45° . What is its order of rotational symmetry?
-
-

- 41 A shape maps onto itself every 120° . What is its order?

- 42 A regular polygon has order of rotational symmetry 12. What is its smallest turn, in degrees?

- 43 How many lines of symmetry does a regular 20-sided polygon have?

- 44 Can a shape have 3 lines of symmetry but order 2?
☐ Yes
☐ No

D · Word problems — Symmetry in real objects.

- 45 A snowflake pattern maps onto itself every 60° . What is its order of rotational symmetry?

- 46 A car wheel has 5 identical spokes. What is its order of rotational symmetry?

- 47 A square tile is turned until it looks the same. What is the smallest turn, in degrees?

- 48 A rectangular flag has how many lines of symmetry?

- 49 A capital letter H has how many lines of symmetry?

- 50 A capital letter S has what order of rotational symmetry?

- 51 A three-blade fan has what order of rotational symmetry?

- 52 An equilateral triangular road sign has how many lines of symmetry?
