ROTATIONAL SYMMETRY

BUILDING BLOCKS

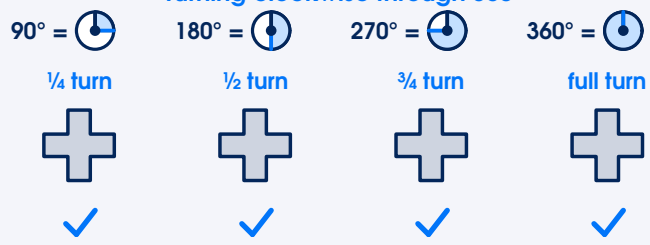
NAME _____ CLASS _____ DATE _____

KEY IDEA

Turn the shape about its centre through a full turn (360°).
Count how many times it looks exactly the same as at the start.

Turning clockwise through 360°





It looks the same 4 times, so it has order 4.

1 What angle is each turn? Write it in degrees.



½ turn = ____ °



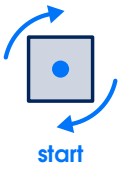
¾ turn = ____ °



2 quarter turns = ____ °

2 The square is turned clockwise. Draw a tick if it looks exactly the same, or a cross if not. Then write the order.

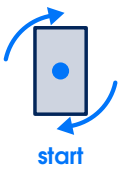
Turning clockwise through 360°



90°	180°	270°	360°	order

3 Do the same for this rectangle.

Turning clockwise through 360°



90°	180°	270°	360°	order

4 Find the order of rotation of these shapes.

Use tracing paper, or turn your sheet.

a)



order: .....

b)



order: .....

c)



order: .....

d)



order: .....

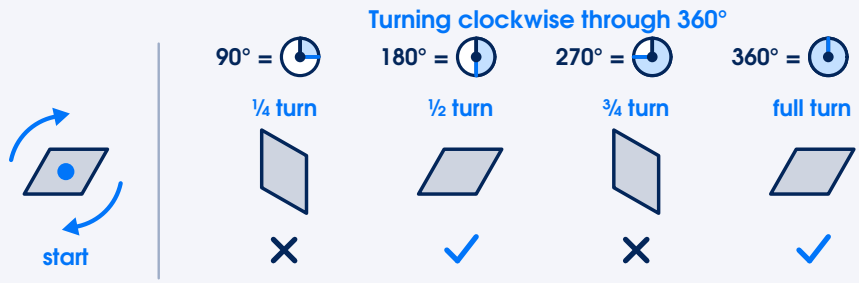
ROTATIONAL SYMMETRY

SUPPORT

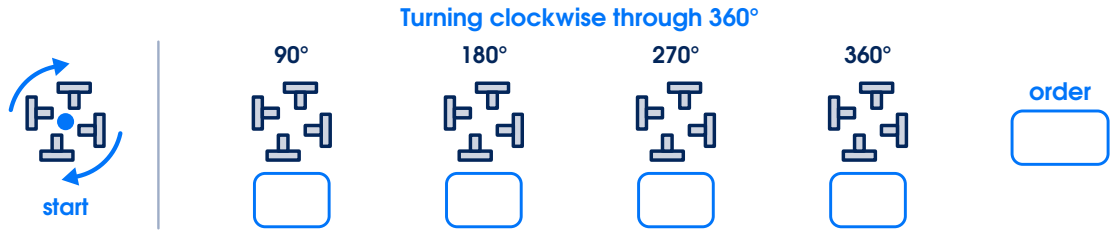
NAME _____ CLASS _____ DATE _____

KEY IDEA

The order of rotational symmetry is the number of times a shape looks exactly the same in one full turn about its centre. Every shape looks the same at 360°, so the order is never 0.



1 This shape is turned clockwise. Draw a tick if it looks exactly the same, or a cross if not. Then write the order.



2 Find the order of rotation of these shapes.

a) order: .....



b) order: .....



c) order: .....



d) order: .....



3 Is each statement true or false? Circle your answer.

a) A shape can have rotational symmetry of order 0. TRUE FALSE

b) A rectangle has rotational symmetry of order 2. TRUE FALSE

c) A kite has rotational symmetry of order 1. TRUE FALSE

4 Find the order of rotation of each pattern.

a) order: .....



b) order: .....



c) order: .....



d) order: .....



ROTATIONAL SYMMETRY

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

The order of rotational symmetry is the number of times a shape looks the same in a full turn about its centre. It is always at least 1. The number of lines of symmetry and the order are not always equal.

FLUENCY

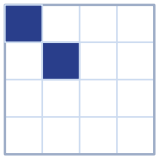
1 Complete the table for shapes A to D.



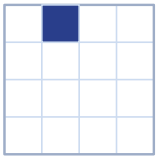
	A	B	C	D
lines of symmetry				
order of rotation				

2 Shade squares so each pattern looks the same when it is turned about its centre.

a) Shade 2 more squares to make order 2.



b) Shade 3 more squares to make order 4.



REASONING

3 Find the order of rotation of these shapes.

a)



order: .....

b)



order: .....

c)



order: .....

d)



order: .....

4 Tom says, "If a shape has rotational symmetry of order 2, it must have 2 lines of symmetry." Sketch a shape to show Tom is wrong. Explain your answer.

sketch

.....

.....

.....

ROTATIONAL SYMMETRY

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, sketch an example of when it is true and when it is not.

a) A shape with order 4 has 4 lines of symmetry. ALWAYS SOMETIMES NEVER

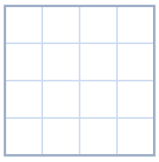
b) A triangle has rotational symmetry of order 2. ALWAYS SOMETIMES NEVER

c) A shape with exactly 2 lines of symmetry has order 2. ALWAYS SOMETIMES NEVER

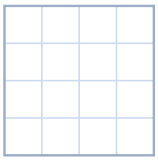
PROBLEM SOLVING

2 Shade exactly 4 squares on each grid to match the description.

a) **order 4**
no lines of symmetry



b) **order 2**
no lines of symmetry



3 Answer these questions about angles of turn.

a) A shape looks the same after every 40° turn. What is its order? ☐

b) What is the smallest angle you can turn a regular octagon so it looks the same? ☐

c) Can a shape have order 6 and exactly 3 lines of symmetry? Explain.

★ CHALLENGE FOR ALL

4 Each shape is made from 4 squares. Complete the table. Then write the letter of the shape with order 2 but no lines of symmetry. ☐



	A	B	C	D	E
lines of symmetry					
order of rotation					

ROTATIONAL SYMMETRY · ANSWERS

ANSWERS

BUILDING BLOCKS

1 ½ turn = 180° · ¾ turn = 270° · 2 quarter turns = 180°
2 90°, 180°, 270°, 360°: ✓, ✓, ✓, ✓ · order 4
3 90°, 180°, 270°, 360°: ×, ✓, ×, ✓ · order 2
4 a) 2 · b) 1 · c) 2 · d) 1

SUPPORT

1 90°, 180°, 270°, 360°: ✓, ✓, ✓, ✓ · order 4
2 a) 3 · b) 5 · c) 1 · d) 6
3 a) FALSE (the smallest order is 1) · b) TRUE · c) TRUE
4 a) 2 · b) 4 · c) 3 · d) 1

CORE

1 A: 2 lines, order 2 · B: 0 lines, order 2 · C: 3 lines, order 3 · D: 1 line, order 1
3 a) 5 · b) 4 · c) 3 · d) 2
4 e.g. a parallelogram (or the Z shape): it looks the same after a half turn, so it has order 2, but it has no lines of symmetry. So order 2 does not mean 2 lines.

2a



2b



GREATER DEPTH

1 a) sometimes (a square: yes; the T design on the Support and Core sheets has order 4 and no lines) · b) never (a triangle has order 1 or 3) · c) always (the two lines are at right angles, so a half turn maps the shape onto itself)
2 e.g. as shown (other answers possible; check there are no lines of symmetry)
3 a) 360 ÷ 40 = 9 · b) 360 ÷ 8 = 45° · c) No. If a shape has exactly 3 lines of symmetry, its order is 3. A shape with lines of symmetry has the same number of lines as its order.
4 A: 2, 2 · B: 4, 4 · C: 1, 1 · D: 0, 1 · E: 0, 2 · Shape E

2a



2b

