Symmetry

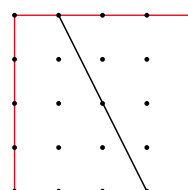- **Understanding congruence**
- **Identifying the number of lines of symmetry of a shape**
- **Identifying the order of rotational symmetry of a shape**

Keywords

You should know

explanation 1

1 The diagram shows a square on square dotted paper.
It has been split into two congruent shapes.

   a Draw a square like this on square dotted paper.
   Split the square differently to make two congruent shapes.

   b Draw three more of these squares.
   Split each one into two congruent shapes in a different way.

2 The diagram shows a square on square dotted paper.
It has been split into four congruent shapes.
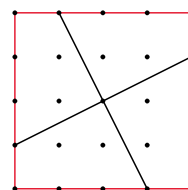
   a Draw a square like this on square dotted paper.
   Split the square differently to make four congruent shapes.

   b Draw three more of these squares.
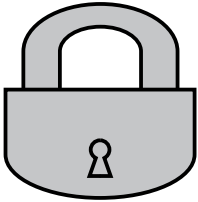   Split each one into four congruent shapes in a different way.

3 Which of these shapes are congruent to shape X?
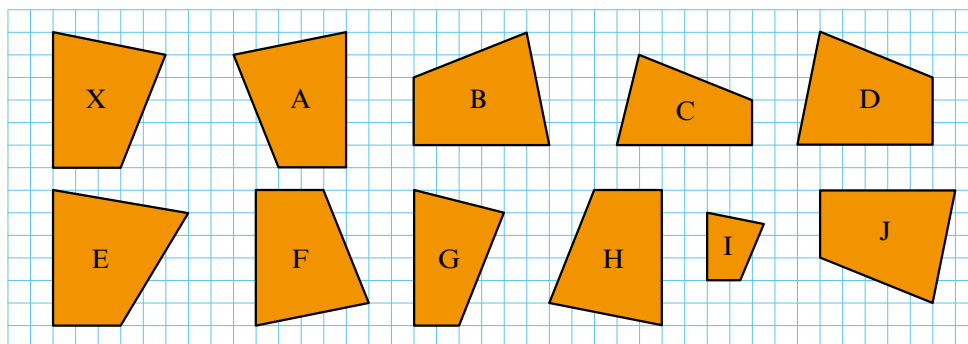
explanation 2

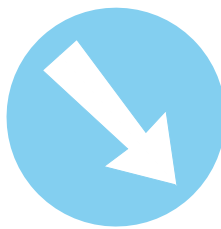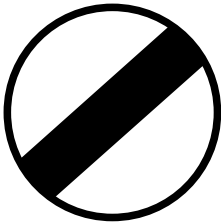**4** How many lines of symmetry does each picture have?

a

b

c

d

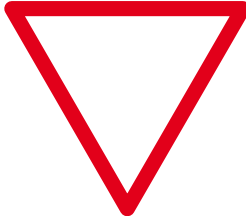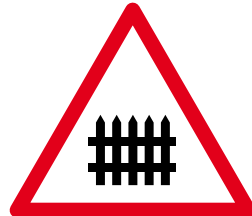

e

f

g

h

i

j

k

l
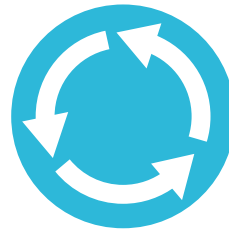
m

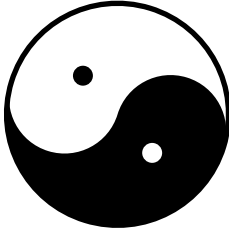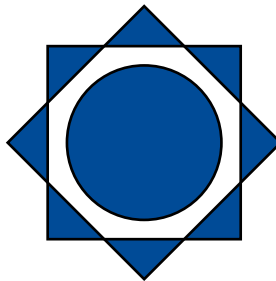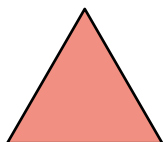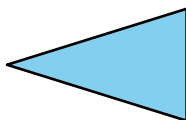n

o

5 Copy the shapes. Mark on any lines of symmetry.

    a equilateral triangle   **b** isosceles triangle   **c** square

    d rectangle   **e** arrowhead   **f** kite
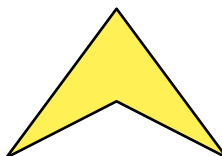
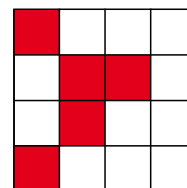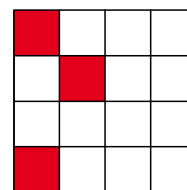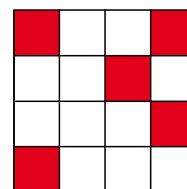   **g** parallelogram   **h** isosceles trapezium   **i** regular hexagon
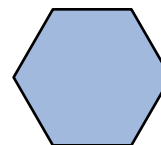
6 Copy the grid. Colour 3 more squares so that the grid has four lines of symmetry.

7 Copy the grid. Colour 3 more squares so that the grid has two lines of symmetry.

8 Copy the grid. Colour 3 more squares so that the grid has one line of symmetry.

explanation 3

9 Which of the pictures from question **4** have rotational symmetry? For each picture with rotational symmetry, state the order of rotational symmetry.

10 Which of the shapes from question **5** have rotational symmetry?
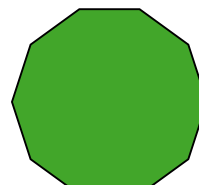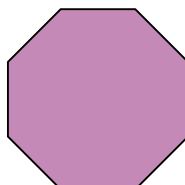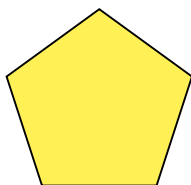Copy and complete the table. The first shape has been done for you.

Shape	Rotational symmetry?	Order
Equilateral triangle	Yes	3
Isosceles triangle		
Square		
Rectangle		
Arrowhead		
Kite		
Parallelogram		
Isosceles trapezium		
Regular hexagon		

11 a State the order of rotational symmetry of each shape.

   i regular pentagon   **ii** regular octagon   **iii** regular decagon

   b What do you notice about the rotational symmetry of regular shapes?

12 a Copy the grid. Colour 4 more squares so that the grid has rotational symmetry of order 4.

   b Copy the grid again. Colour 4 more squares to make a different pattern so that the grid has rotational symmetry of order 4.

   c Copy the grid again. Colour 4 more squares so that the grid has rotational symmetry of order 2.