Symmetry - Worksheet

Skill

Group A - Lines of symmetry in quadrilaterals

State the number of lines of symmetry for the following quadrilaterals:

1) Square

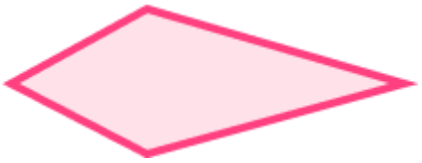
2) Rectangle

3) Parallelogram

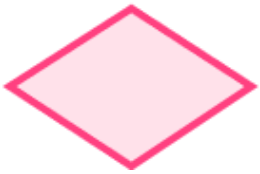
4) Parallelogram

5) Rhombus

6) Kite



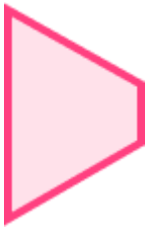
7) Diamond



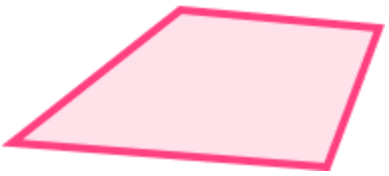
8) Trapezium

9) Isosceles Trapezium

10) Isosceles Trapezium



11) Irregular Quadrilateral



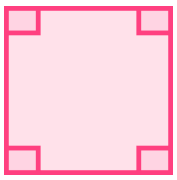
12) Arrowhead

Symmetry - Worksheet

Group B - Angle facts

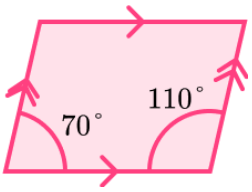
Use angle facts to determine the number of lines of symmetry:

1)

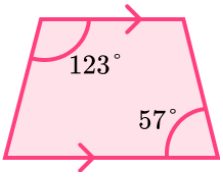


2)

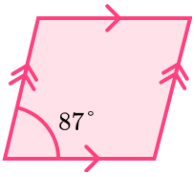
3)



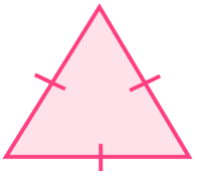
4)



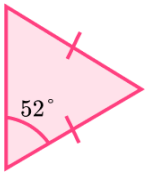
5)



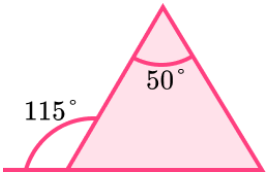
6)



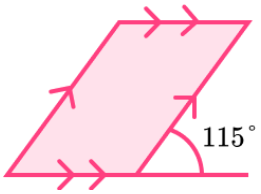
7)



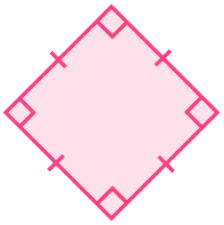
8)



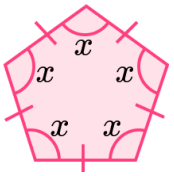
9)



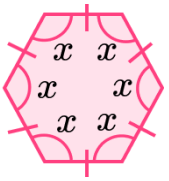
10)



11)



12)



Symmetry - Worksheet

Group C - Rotational symmetry in polygons

State the order of rotational symmetry for the following polygons:

1) Square

2) Rectangle

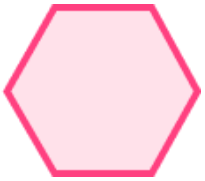
3) Parallelogram

4) Rhombus

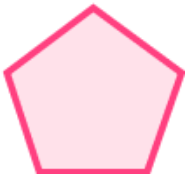
5) Equilateral Triangle

6) Isosceles Triangle

7) Regular Hexagon



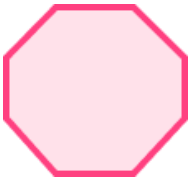
8) Regular Pentagon



9) Isosceles Trapezium

10) Cross

11) Regular Octagon

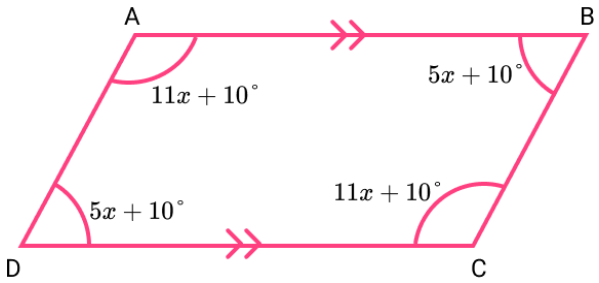


12) Arrowhead

Symmetry - Worksheet

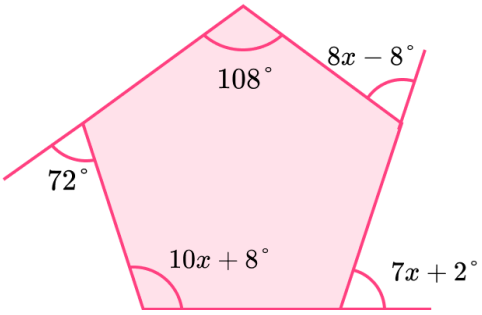
Applied

1) **(a)** Calculate the value of x.



(b) State the order of rotational symmetry for $ABCD$.

2) **(a)** The shape below is a regular polygon. Calculate the value of x.



(b) State the number of lines of symmetry for the shape in part (a).

3) **(a)** What set of shapes have the same number of lines of symmetry as their order of rotational symmetry?

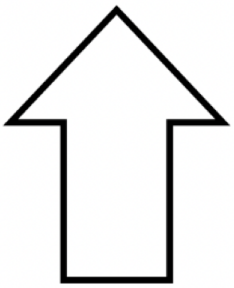
(b) Give the name of a quadrilateral that has an order of rotational symmetry greater than their number of lines of symmetry.

4) **(a)** Draw two congruent isosceles triangles. By joining one side the triangles together, create two different shapes that have a rotational symmetry of order 2.

(b) Draw the net of a regular tetrahedron so that it has a rotational symmetry of 3and 3 lines of symmetry. Do not include tabs.

Symmetry - Exam Questions

1) An arrow is drawn below.

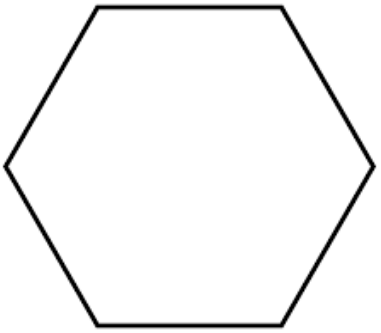


Draw all the lines of symmetry on this shape.

(1 mark)

---

2) The diagram below shows a regular hexagon.



(a) Write down the order of rotational symmetry of the hexagon.

.....

(1)

(b) On the diagram draw all the lines of symmetry.

(2)

(3 marks)

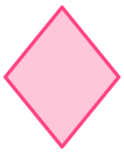
Symmetry - Exam Questions

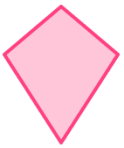
3) **(a)** How many lines of symmetry does a regular octagon have?

.....

(1)

(b) Match each polygon to their correct description:





Rotational Symmetry = 2
Lines of Symmetry = 0

Rotational Symmetry = 6
Lines of Symmetry = 6

Rotational Symmetry = 3
Lines of Symmetry = 3

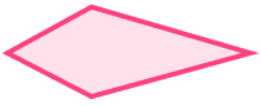
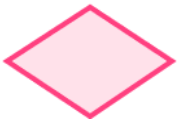
Rotational Symmetry = 4
Lines of Symmetry = 4

Rotational Symmetry = 1
Lines of Symmetry = 1

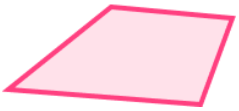
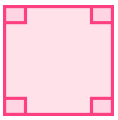
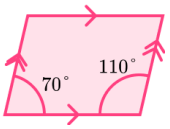
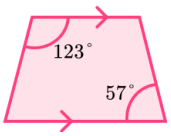
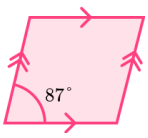
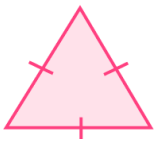
Rotational Symmetry = 2
Lines of Symmetry = 2

(5 marks)

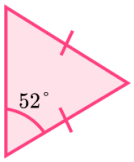
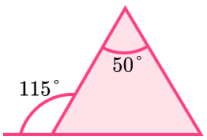
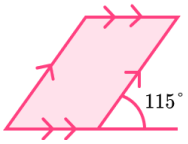
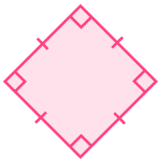
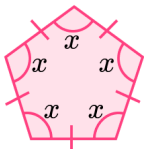
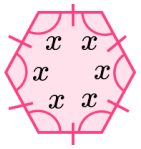
Symmetry - Answers

	Question	Answer
	Skill Questions	
Group A	State the number of lines of symmetry for the following quadrilaterals:	
	1) Square 	**1)** 4
	2) Rectangle 	**2)** 2
	3) Parallelogram 	**3)** 0
	4) Parallelogram 	**4)** 0
	5) Rhombus 	**5)** 2
	6) Kite 	**6)** 1
	7) Diamond 	**7)** 2
	8) Trapezium 	**8)** 0

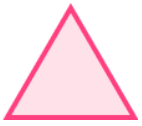
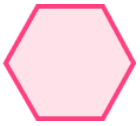
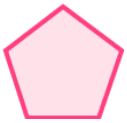
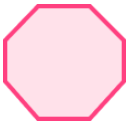
Symmetry - Answers

Group A contd	**9)** Isosceles Trapezium 	**9)** 1
	10) Isosceles Trapezium 	**10)** 1
	11) Irregular Quadrilateral 	**11)** 0
	12) Arrowhead 	**12)** 1
Group B	Use angle facts to determine the number of lines of symmetry:	
	1) 	**1)** 4, all four angles are equal to 90° (and all side lengths equal)
	2) 	**2)** 2, all four angles are equal to 90°
	3) 	**3)** 0, co-interior angles total 180°, opposing angles are equal
	4) 	**4)** 1, co-interior angles total 180°, adjacent angles are equal
	5) 	**5)** 0, co-interior angle = 93°, opposing angles are equal, not adjacent
	6) 	**6)** 3, all equal angles of 60° (equilateral triangle / regular polygon)

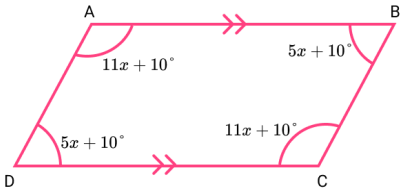
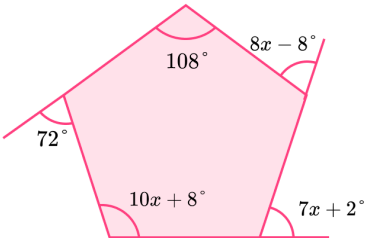
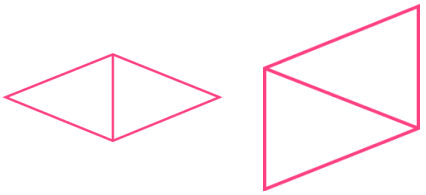
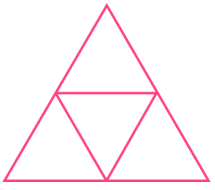
Symmetry - Answers

Group B contd	**7)** 	**7)** 1, Other two angles are 52° and 76°
	8) 	**8)** 1, other two interior angles are 65° and 65°, angles on a straight line total 180°
	9) 	**9)** 0, opposite interior angles are 65° and 115°
	10) 	**10)** 4, as all sides are parallel and two sides are perpendicular, all angles equal 90° (assuming a square)
	11) 	**11)** 5, all sides equal length, regular pentagon, all interior angles equal
	12) 	**12)** 6, all equal angles and all equal sides
Group C	Calculate the order of rotational symmetry for the following polygons: **1)** Square  **2)** Rectangle  **3)** Parallelogram 	**1)** 4 **2)** 2 **3)** 2

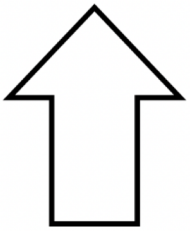
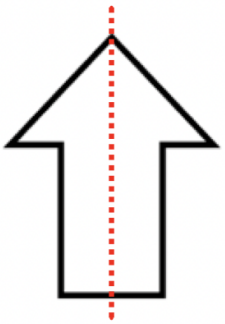
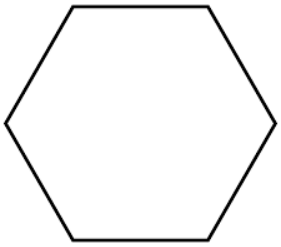
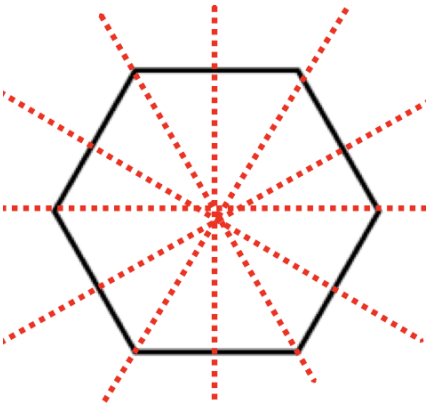
Symmetry - Answers

Group C contd	**4)** Rhombus 	**4)** 2
	5) Equilateral Triangle 	**5)** 3
	6) Isosceles Triangle 	**6)** 1
	7) Regular Hexagon 	**7)** 6
	8) Regular Pentagon 	**8)** 5
	9) Isosceles Trapezium 	**9)** 1
	10) Cross 	**10)** 4
	11) Regular Octagon 	**11)** 8
	12) Arrowhead 	**12)** 1

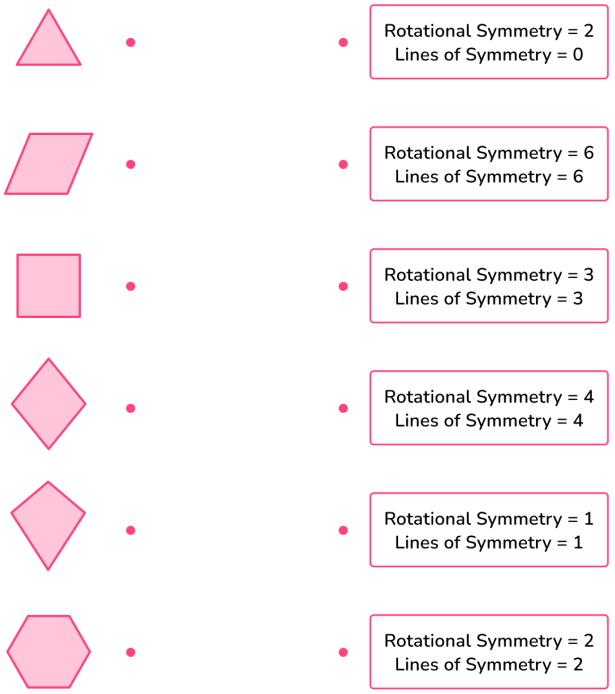
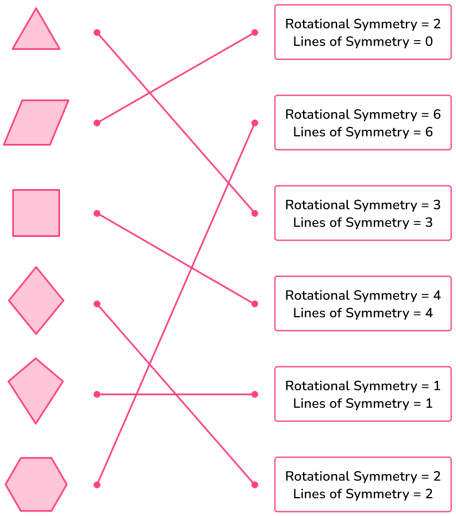
Symmetry - Answers

	Question	Answer
	Applied Questions	
1)	**a)** Calculate the value of x.  **b)** State the order of rotational symmetry for $ABCD$.	**a)** $5x + 10 + 11x + 10 = 180$ $16x + 20 = 180$ $16x = 160$ $x = 10$ **b)** 2
2)	**a)** The shape below is a regular polygon. Calculate the value of x.  **b)** State the number of lines of symmetry for the shape in part (a).	**a)** One of the following: $8x - 8 = 72$ $7x + 2 = 72$ or $10x + 8 = 108$ $x = 10$ **b)** 5
3)	**(a)** What set of shapes have the same number of lines of symmetry as their order of rotational symmetry? **b)** Give the name of a quadrilateral that has an order of rotational symmetry greater than their number of lines of symmetry.	**a)** Regular polygons **b)** Parallelogram
4)	**a)** Draw two congruent isosceles triangles. By joining one side of each triangle together, create two shapes that have a rotational symmetry of order 2. **b)** Draw the net of a regular tetrahedron so that it has a rotational symmetry of 3 and 3 lines of symmetry. Do not include tabs.	**a)**  **b)** 

Symmetry - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	An arrow is drawn below.  Draw all the lines of symmetry on this shape.		(1)
2)	The diagram below shows a regular hexagon. 		
(a)	Write down the order of rotational symmetry of the hexagon.	(a) 6	(1)
(b)	On the diagram draw all the lines of symmetry.	(b)  3 correct lines of symmetry Fully correct diagram	(1) (1)

Symmetry - Answers

3) (a)	How many lines of symmetry does a regular octagon have?	**(a)** 8	**(1)**
(b)	Match each polygon to their correct description: 	 One correct match Two correct matches Four correct matches All six correctly matched	**(1)** **(1)** **(1)** **(1)**

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