

Board – CBSE

Class – 7th

Topic – Symmetry 14.3

**Q.1** Name any two figures that have both line symmetry and rotational symmetry.

**Sol:** Equilateral triangle and regular hexagon have both line of symmetry and rotational symmetry.

**Q.2** Draw, wherever possible, a rough sketch of

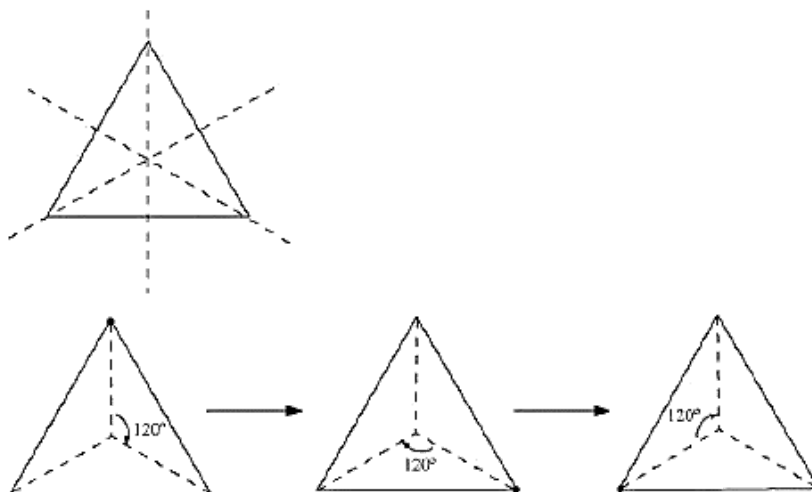
(i) A triangle with both line and rotational symmetries of order more than 1.

(ii) A triangle with only line symmetry and no rotational symmetry of order more than 1.

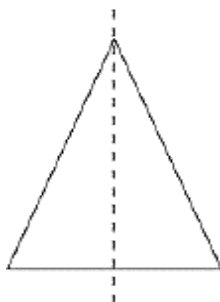
(iii) A quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry.

(iv) A quadrilateral with line symmetry but not a rotational symmetry of order more than 1.

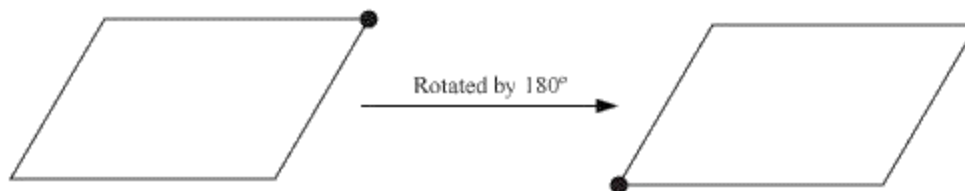
**Sol:** (i) Equilateral triangle has 3 lines of symmetry and rotational symmetry of order 3.



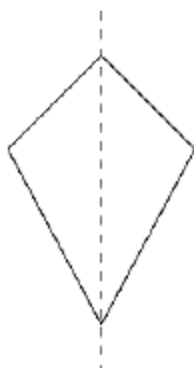
(ii) Isosceles triangle has only 1 line of symmetry and no rotational symmetry of order more than 1.



(iii) A parallelogram is a quadrilateral which has no line of symmetry but a rotational symmetry of order 2.



(iv) A kite is a quadrilateral which has only 1 line of symmetry and no rotational symmetry of order more than 1.



**Q.3** If a figure has two or more lines of symmetry, should it have rotational symmetry of order more than 1?

**Sol:** Yes. If a figure has two or more lines of symmetry, then it will definitely have its rotational symmetry of order more than 1.

**Q.4** Fill in the blanks:

Shape	Centre of Rotation	Order of Rotation	Angle of Rotation
Square	-	-	-
Rectangle	-	-	-
Rhombus	-	-	-
Equilateral Triangle	-	-	-
Regular Hexagon	-	-	-
Circle	-	-	-

Semi-circle	-	-	-
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Shape	Centre of Rotation	Order of Rotation	Angle of Rotation
Square	Intersection point of diagonals	4	$90^\circ$
Rectangle	Intersection point of diagonals	2	$180^\circ$
Rhombus	Intersection point of diagonals	2	$180^\circ$
Equilateral Triangle	Intersection point of medians	3	$120^\circ$
Regular Hexagon	Intersection point of diagonals	6	$60^\circ$
Circle	Centre	Infinite	Any angle
Semi-circle	Centre	1	$360^\circ$

**Sol:**

**Q.5** Name the quadrilaterals which have both line and rotational symmetry of order more than 1.

**Sol:** Square, rectangle, and rhombus are the quadrilaterals which have both line and rotational symmetry of order more than 1. A square has 4 lines of symmetry and rotational symmetry of order 4. A rectangle has 2 lines of symmetry and rotational symmetry of order 2. A rhombus has 2 lines of symmetry and rotational symmetry of order 2.

**Q.6** After rotating by  $60^\circ$  about a centre, a figure looks exactly the same as its original position. At what other angles will this happen for the figure?

**Sol:** It can be observed that if a figure looks symmetrical on rotating by  $60^\circ$ , then it will also look symmetrical on rotating by  $120^\circ$ ,  $180^\circ$ ,  $240^\circ$ ,  $300^\circ$ , and  $360^\circ$  i.e., further multiples of  $60^\circ$ .

**Q.7** Can we have a rotational symmetry of order more than 1 whose angle of rotation is  
(i)  $45^\circ$ ?                      (ii)  $17^\circ$ ?

**Sol:** It can be observed that if the angle of rotation of a figure is a factor of  $360^\circ$ , then it will have a rotational symmetry of order more than 1.

It can be checked that  $45^\circ$  is a factor of  $360^\circ$  but  $17^\circ$  is not. Therefore, the figure having its angle of rotation as  $45^\circ$  will have its rotational symmetry of order more than 1. However, the figure having its angle of rotation as  $17^\circ$  will not be having its rotational symmetry of order more than 1.