

CBSE Class –VII Mathematics
NCERT Solutions
Chapter 14 Symmetry (Ex. 14.3)

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

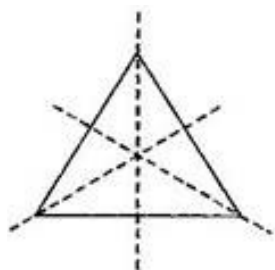
Answer: Circle and Square.

Question 2. Draw, wherever possible, a rough sketch of:

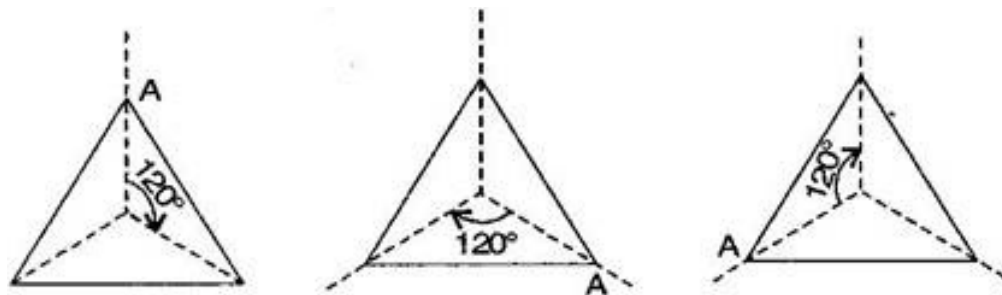
1. a triangle with both line and rotational symmetries of order more than one.
2. a triangle with only line symmetry and no rotational symmetry of order more than one.
3. a quadrilateral with a rotational symmetry of order more than one but not a line symmetry.
4. a quadrilateral with line symmetry but not a rotational symmetry of order more than one.

Answer: (i) An equilateral triangle has both line and rotational symmetries of order more than one.

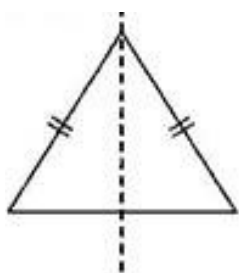
Line symmetry:



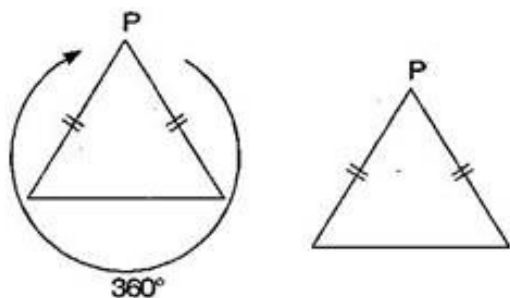
Rotational symmetry:



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



Line symmetry:

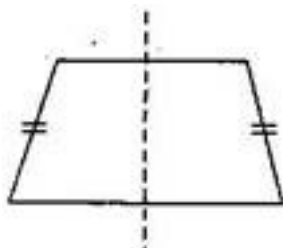


Rotational symmetry:

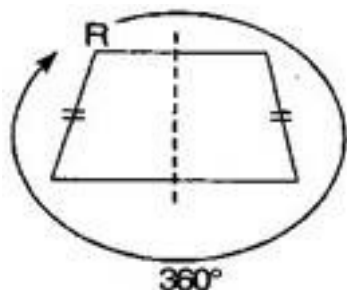
(iii) It is not possible because order of rotational symmetry is more than 1 of a figure, most ascertain the line of symmetry.

(iv) A trapezium which has equal non-parallel sides, a quadrilateral with line symmetry but not a rotational symmetry of order more than 1.

Line symmetry:



Rotational symmetry:



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

Answer: Yes, because every line through the centre forms a line of symmetry and it has

rotational symmetry around the centre for every angle.

Question 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			

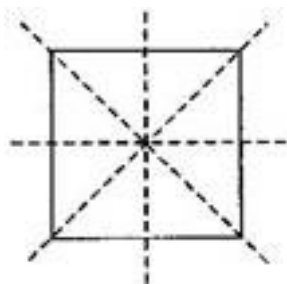
Answer:

Shape	Centre of Rotation	Order of Rotation	Angle of Rotation
Square	Intersecting point of diagonals.	4	90°
Rectangle	Intersecting point of diagonals.	2	180°
Rhombus	Intersecting point of diagonals.	2	180°
Equilateral triangle	Intersecting point of medians.	3	120°
Regular hexagon	Intersecting point of diagonals.	6	60°
Circle	Centre	infinite	At every point
Semi-circle	Mid-point of diameter	1	360°

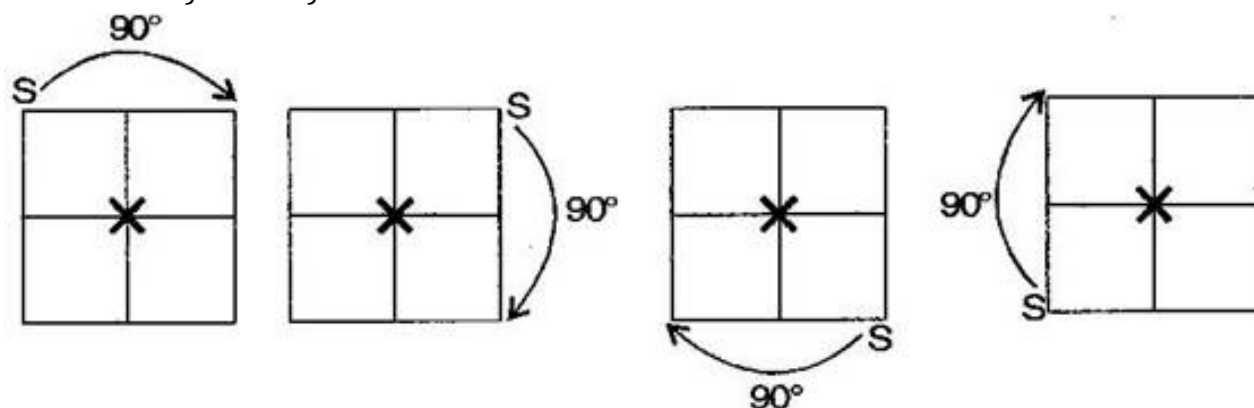
Question 5. Name the quadrilateral which has both line and rotational symmetry of order more than 1.

Answer: Square has both line and rotational symmetry of order more than 1.

Line symmetry:



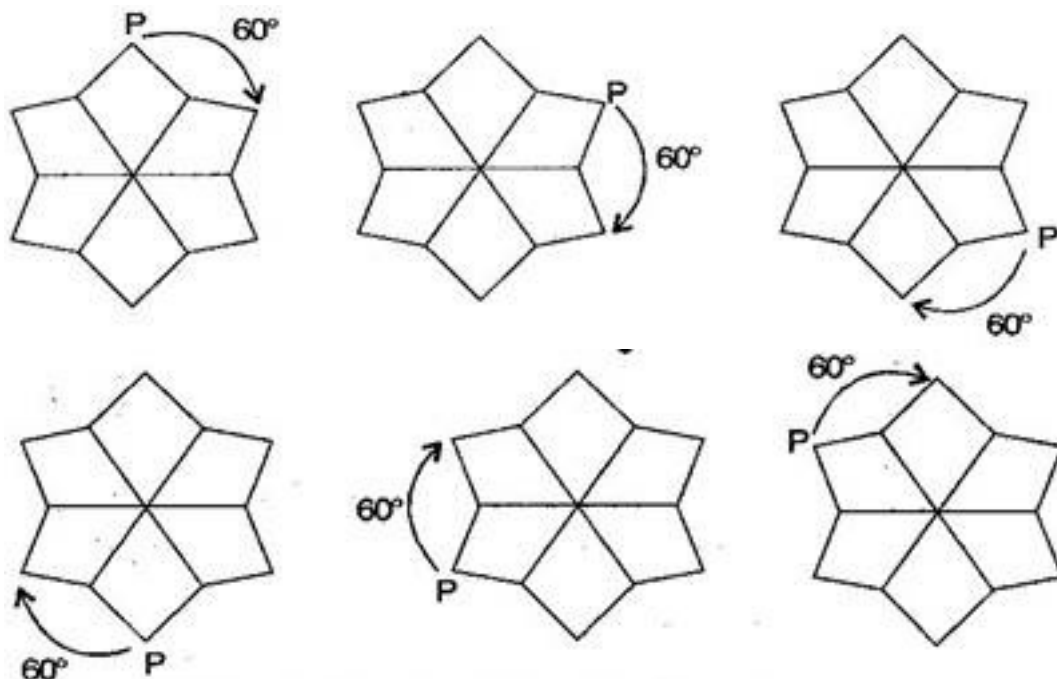
Rotational symmetry:



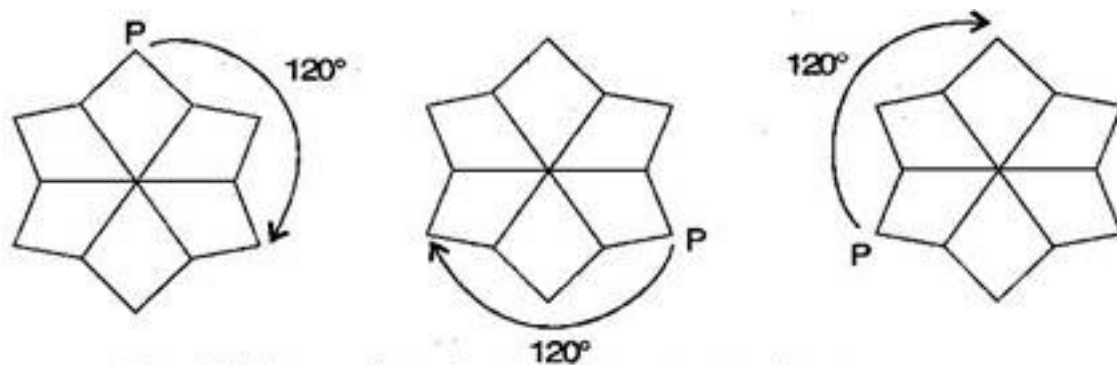
Question 6. After rotating by 60° about a centre, a figure looks exactly the same as its original position. At what other angles will this happen for the figure?

Answer: Other angles will be 120° , 180° , 240° , 300° , 360° .

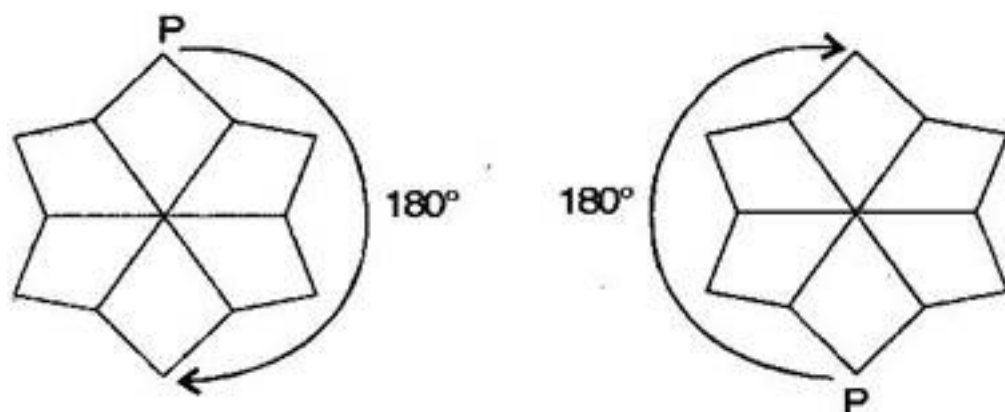
For rotation: It will rotate six times.



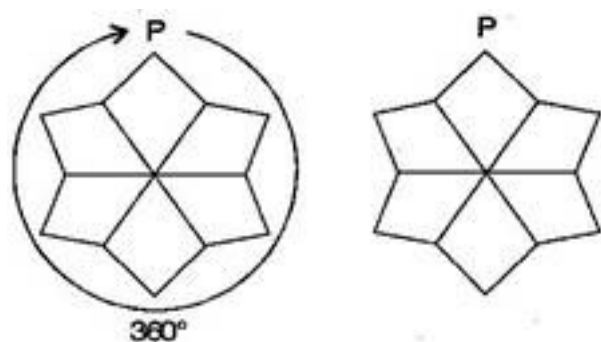
For rotation: It will rotate three times.



For rotation: It will rotate two times.



For rotation: It will rotate one time.



Question 7. Can we have a rotational symmetry of order more than 1 whose angle of rotation is:

(i) 45° (ii) 17° ?

Answer: (i) If the angle of rotation is 45° , then symmetry of order is possible and would be 8 rotations.

(ii) If the angle of rotational is 17° , then symmetry of order is not possible because 360° is not complete divided by 17° .