# Symmetry: Exercise 14.3

**Q.1 Name any two figures that have both line symmetry and rotational symmetry.** *Sol:* Circle and equilateral triangle.



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) Given: A triangle with both line and rotational symmetries of order more than 1.

Equilateral triangle with both line and rotational symmetries of order more than 1.

Line symmetry:



And Rotational Symmetry:



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

(iii) Given: A quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry. A quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry is not possible to draw rough diagram.

(iv) Given: A quadrilateral with line symmetry but not a rotational symmetry of order more than 1. A trapezium with line symmetry but not a 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 should have 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			

#### *Sol:* Complete table:

Shape	<b>Centre of Rotation</b>	Order of Rotation	Angle of Rotation
Square	Intersection point of	4	90°
_	diagonals		
Rectangle	Intersection point of	2	180°
_	diagonals		
Rhombus	Intersection point of	2	180°
	diagonals		
Equilateral	Intersection point of	3	120°
Triangle	diagonals		
Regular	Intersection point of	6	60°
Hexagon	diagonals		
Circle	Centre of circle	Infinite	Every Angle
Semicircle	Centre of circle	4	90°

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

*Sol:* Square is a quadrilateral which have both line and rotational symmetry of order more than 1.



# Q.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?

*Sol:* The other angles will be multiple of 60°, i.e. 120°, 180°, 240°, 300°, 360°. If a figure is rotated through these angles, it looks exactly the same.

## Q.7 Can we have a rotational symmetry of order more than 1 whose angle of rotation is (i) 45°? (ii) 17°?

#### Sol:

1.

(i) Yes, we can have a rotational symmetry of order more than 1 whose angle of rotation is 45°.

(ii) No, we cannot have a rotational symmetry of order more than 1 whose angle of rotation is 17°.