

**EXERCISE 14.3**

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

**Solution:-**

Equilateral triangle and Circle.

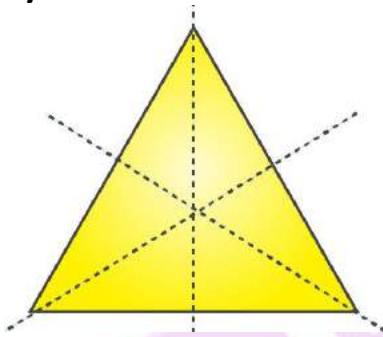
**2. Draw, wherever possible, a rough sketch of**

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

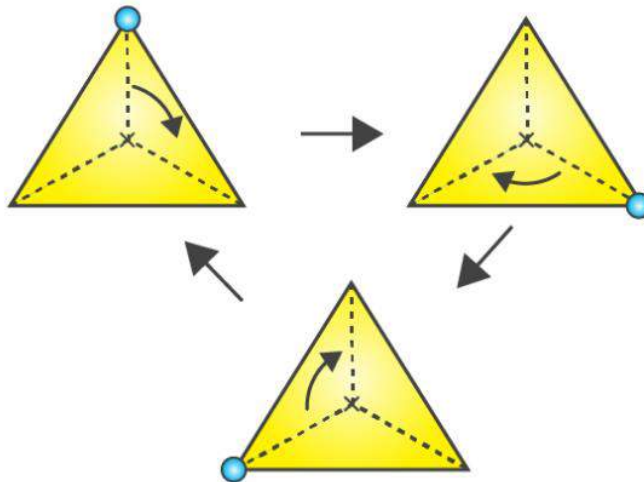
**Solution:-**

A triangle with both line and rotational symmetries of order more than 1 is an equilateral triangle.

**Line symmetry**



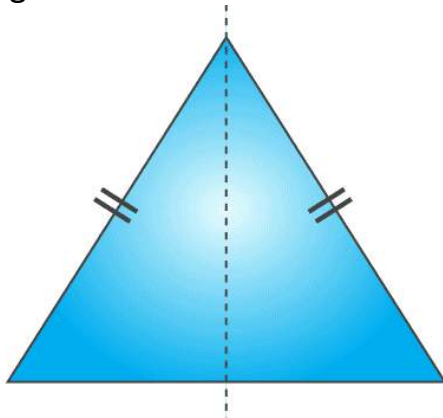
**Rotational symmetry**



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

**Solution:-**

A triangle with only line symmetry and no rotational symmetry of order more than 1 is isosceles triangle.



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

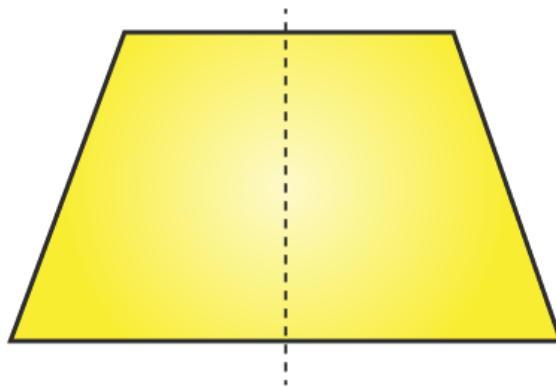
**Solution:-**

A quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry is not possible to draw. Because, a quadrilateral with a line symmetry may have rotational symmetry of order one but not more than one.

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

**Solution:-**

A quadrilateral with line symmetry but not a rotational symmetry of order more than 1 is rhombus.



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

**Solution:-**

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

**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			

**Solution:-**

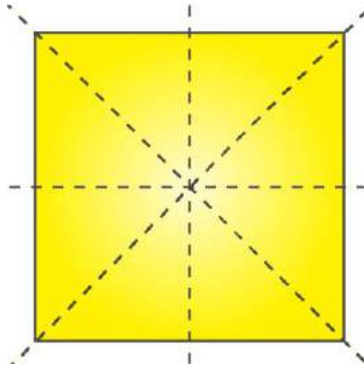
Shape	Centre of Rotation	Order of Rotation	Angle of Rotation
Square	Intersecting point of diagonals	4	$90^\circ$
Rectangle	Intersecting point of diagonals	2	$180^\circ$
Rhombus	Intersecting point of diagonals	2	$180^\circ$
Equilateral Triangle	Intersecting point of medians	3	$120^\circ$
Regular Hexagon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

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

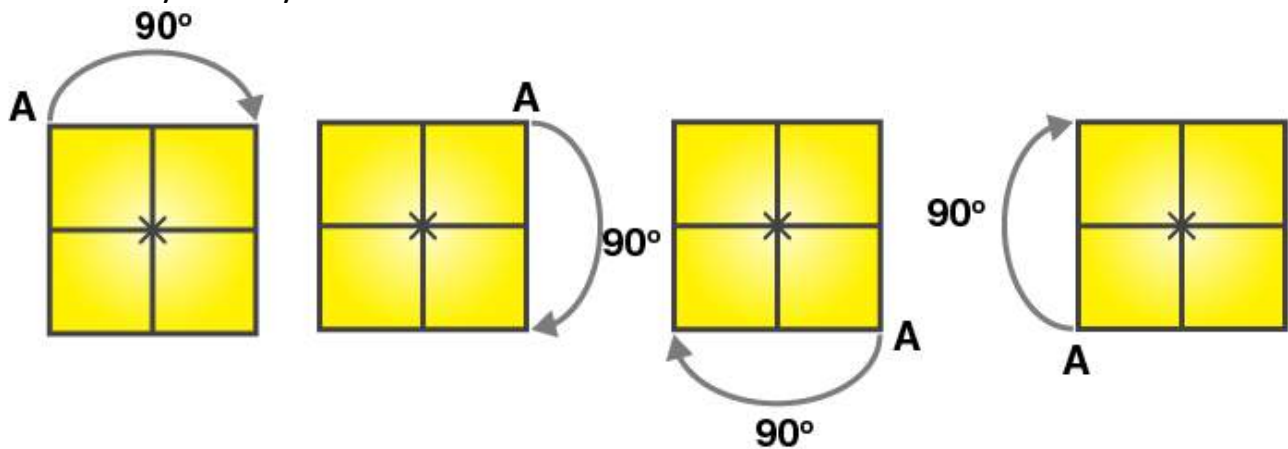
**Solution:-**

The quadrilateral which have both line and rotational symmetry of order more than 1 is square.

Line symmetry:



Rotational symmetry:



**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?**

**Solution:-**

The other angles are,  $120^\circ$ ,  $180^\circ$ ,  $240^\circ$ ,  $300^\circ$ ,  $360^\circ$

So, the figure is said to have rotational symmetry about same angle as the first one.

Hence, the figure will look exactly the same when rotated by  $60^\circ$  from the last position.

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

**Solution:-**

Yes. We can have a rotational symmetry of order more than 1 whose angle of rotation is  $45^\circ$ .

**(ii)  $17^\circ$ ?**

**Solution:-**

No. We cannot have a rotational symmetry of order more than 1 whose angle of rotation is  $17^\circ$ .