EXERCISE 14.3 PAGE: 275

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

Solution:-

Equilateral triangle and circle.
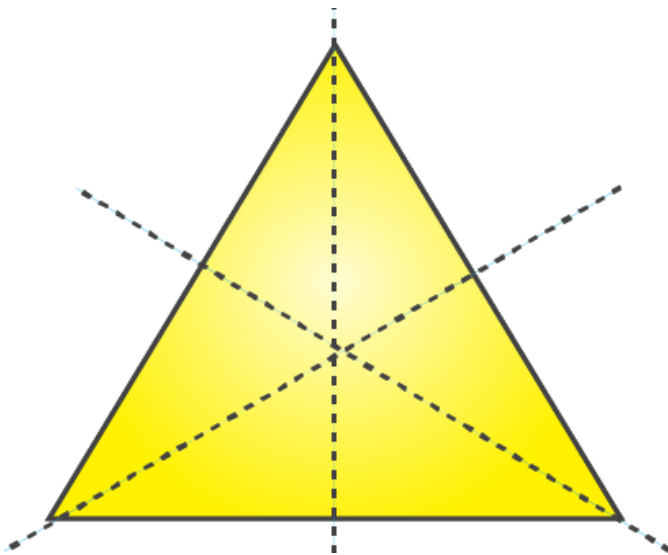
2. Draw, wherever possible, a rough sketch of

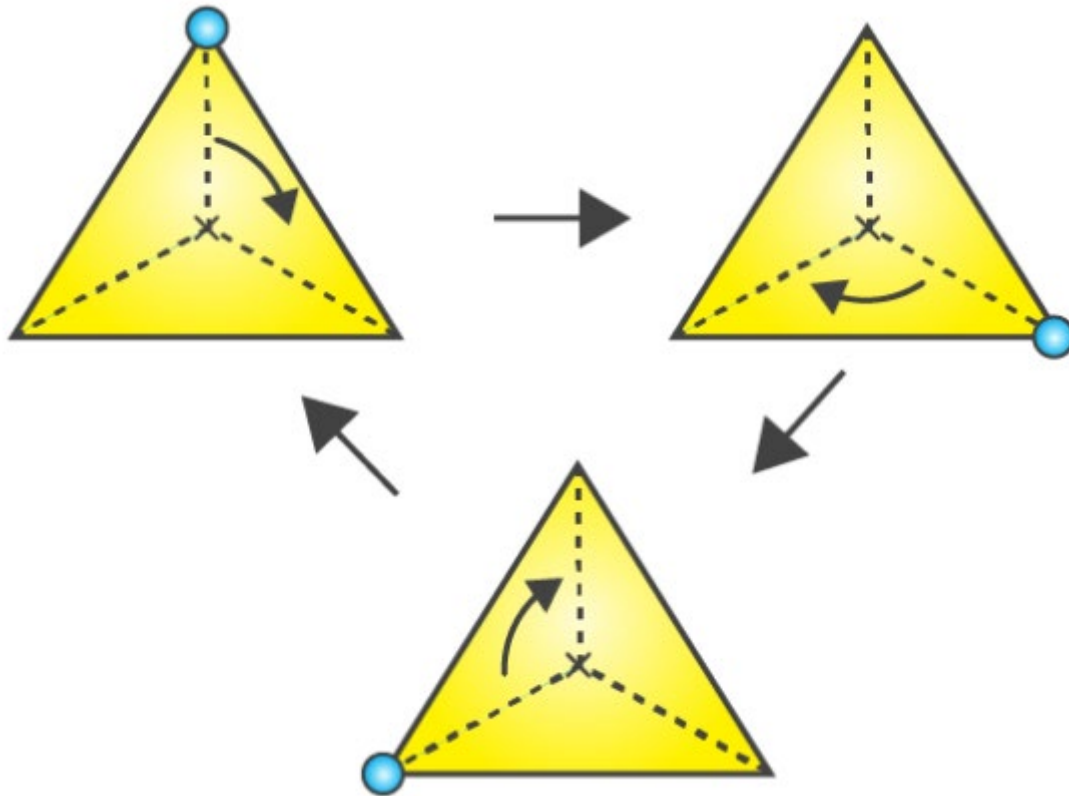**(i) a triangle with both line and rotational symmetries of order more than 1.**

Solution:-

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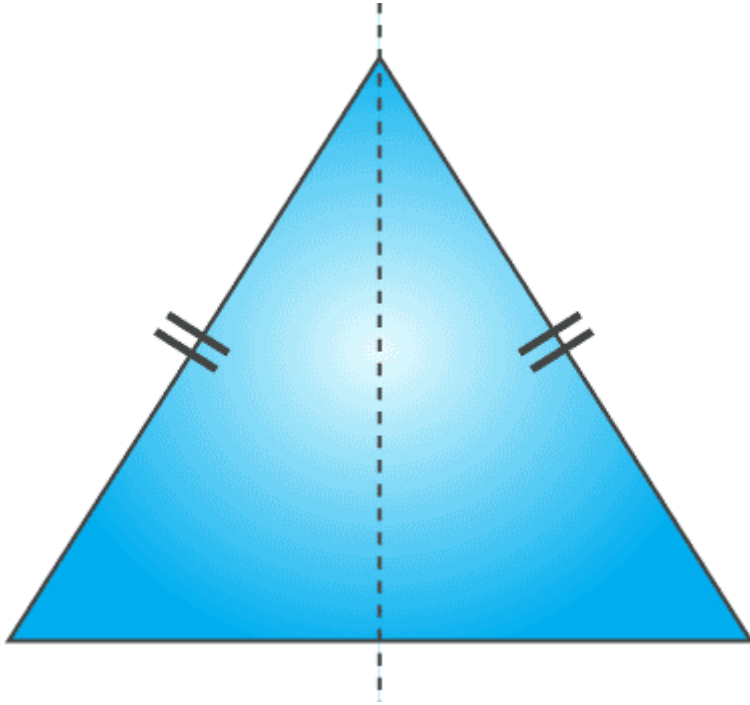
Line symmetry

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.
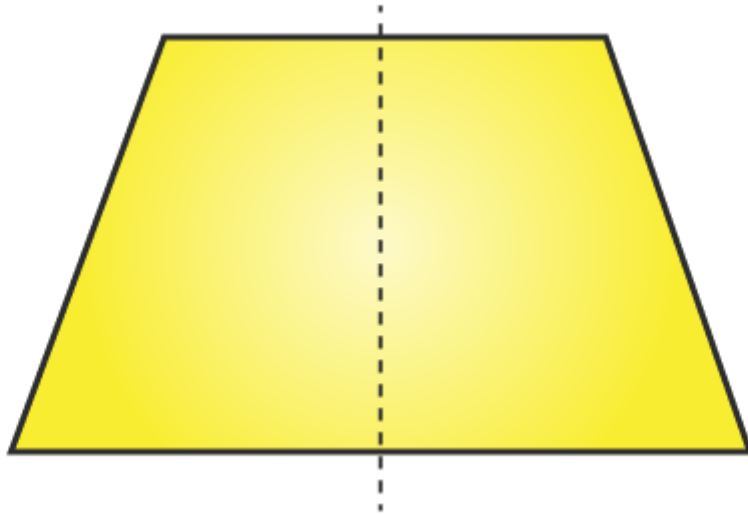
Solution:-

A quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry is not possible to draw. This is 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 a 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°
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	Every angle
Semi-circle	Mid-point of diameter	1	360°

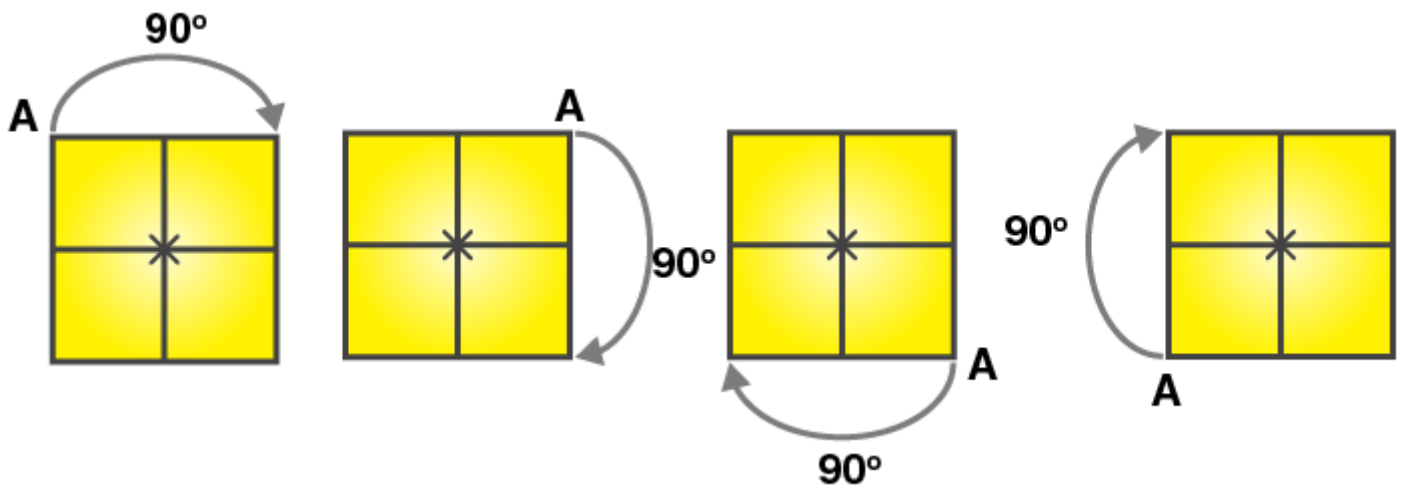**5. Name the quadrilaterals which have both line and rotational symmetry of order more than 1.**

Solution:-

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

Line symmetry:
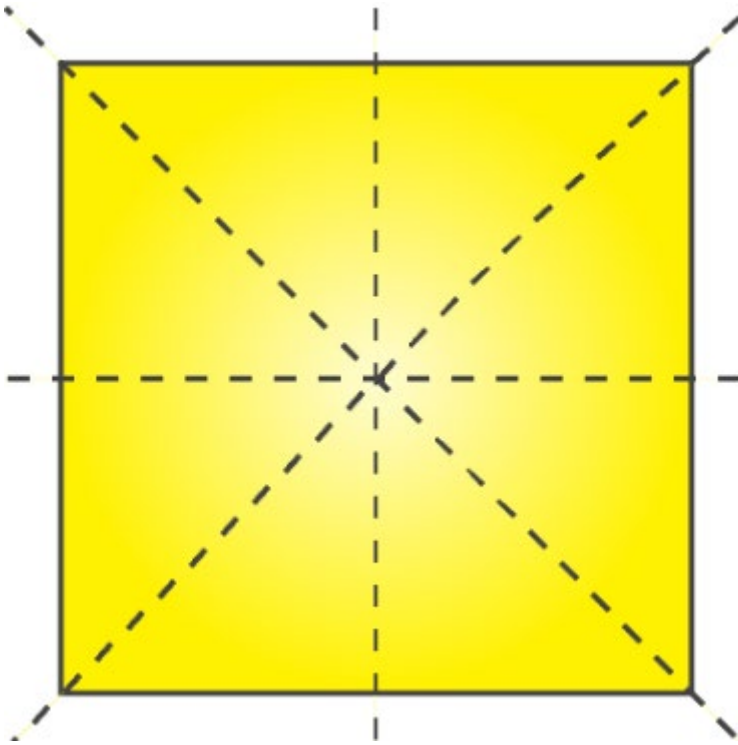
Rotational symmetry:

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?

Solution:-

The other angles are, 120°, 180°, 240°, 300°, 360°

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° from the last position.

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

(i) 45°?

Solution:-

Yes. We can have a rotational symmetry of order more than 1 whose angle of rotation is 45°.

(ii) 17°?

Solution:-

No. We cannot have a rotational symmetry of order more than 1 whose angle of rotation is 17°.