



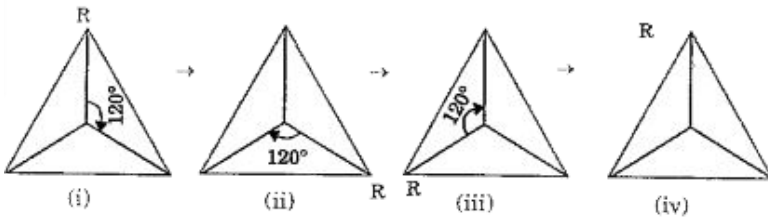
MATHS

BOOKS - NAND LAL PUBLICATION

SYMMETRY

Try These

1. (a) Can you now tell the order of the rotational symmetry for an equilateral triangle ?

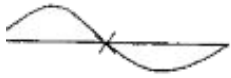


(b) How many position are there at which the triangle looks acactly the same when rotated about its centre by 120° ?



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2. Which of the following shapes have rotational symmetry about the marked point.



(i)



(ii)



(iii)



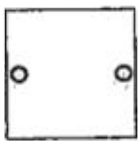
(iv)



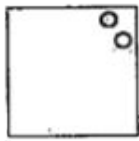
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Exercise 14 1

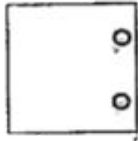
1. Copy the figures with punched holes and find the axes of symmetry for the following :



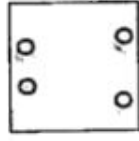
(a)



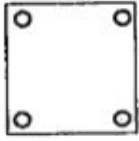
(b)



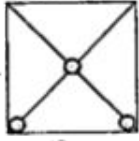
(c)



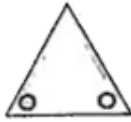
(d)



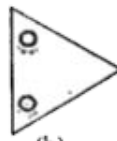
(e)



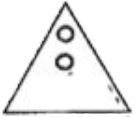
(f)



(g)



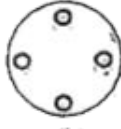
(h)



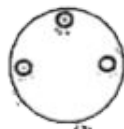
(i)



(j)



(k)

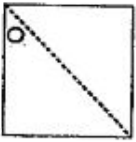


(l)



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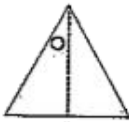
2. Given the lines (s) of symmetry find the other hole (s)



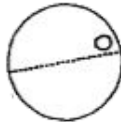
(a)



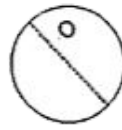
(b)



(c)



(d)



(e)

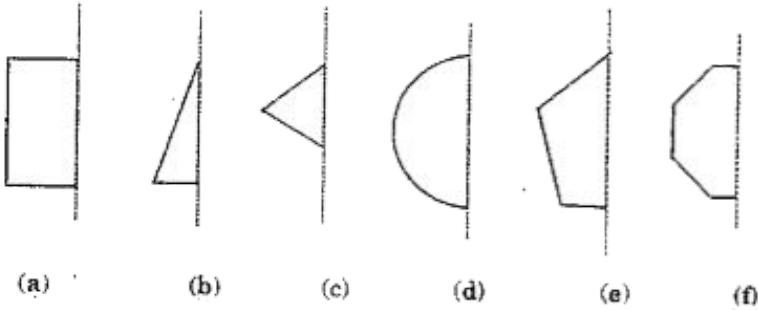


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3. In the following figures, the mirror line (i.e. the line of symmetry) is given as dotted line. Complete each figure performing reflection in the

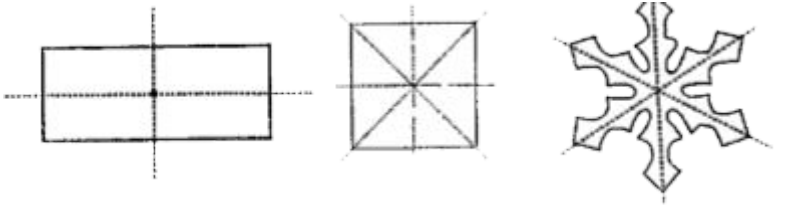
dotted (mirror) line. (you might perhaps place a mirror along the dotted line and look into the mirror for the image)

Are you able to recall the name of the figure you complete ?

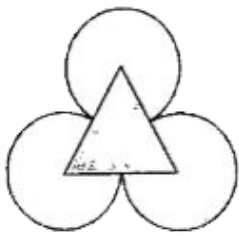


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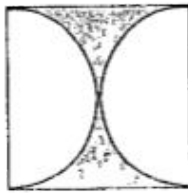
4. The following figures have more than one line of symmetry. Such figures are said to have multiple lines of symmetry.



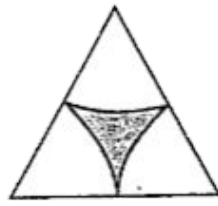
Identify multiple line of symmetry. If any, in each of the following figures.



(a)



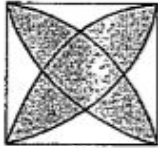
(b)



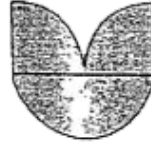
(c)



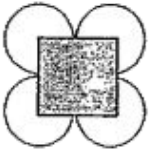
(d)



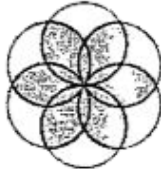
(e)



(f)



(g)



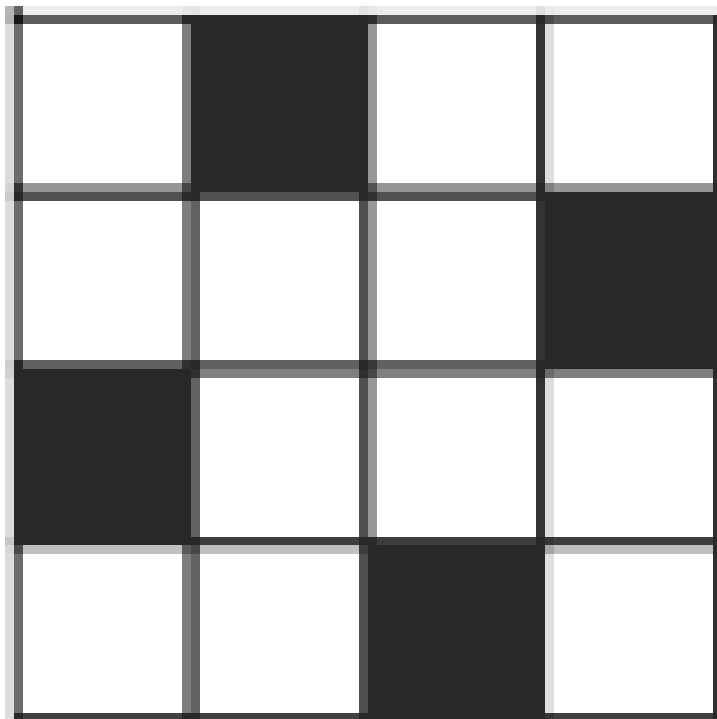
(h)



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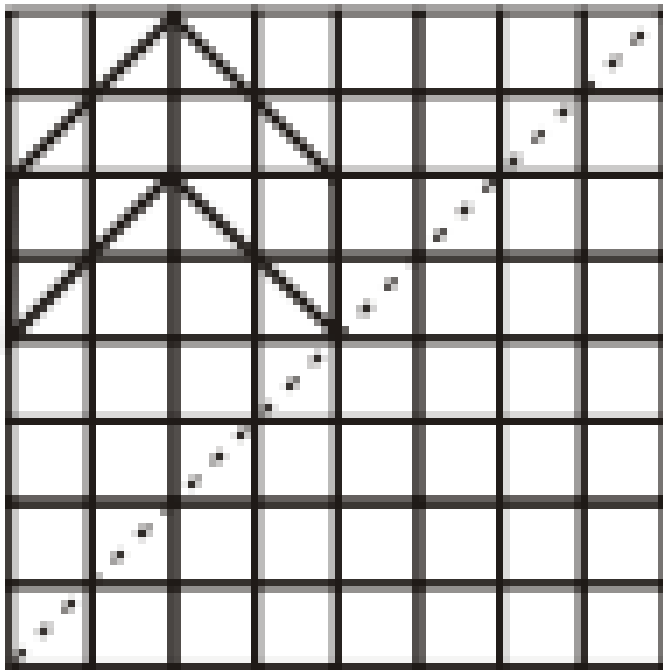
5. Copy the figure given here. Take any one diagonal as a line of symmetry and shade a few more squares to make the figure symmetric about a diagonal. Is there more than one way to do that? Will the figure be

symmetric about both the diagonals?



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6. Copy the diagram and complete each shape to be symmetric about the mirror line(s)



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7. State the number of lines of symmetry for the following figures :

- (a) An equilateral triangle
- (b) An isosceles triangle
- (c) A scalene triangle
- (d) A square
- (e) A rectangle

(f) A rhombus

(g) A parallelogram

(h) A quadrilateral

(i) A regular hexagon

(j) A circle



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8. What letters of the English alphabet have reflectional symmetry (i.e., symmetry related to mirror reflection) about.

a vertical mirror



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9. Give three examples of shapes with no line of symmetry.



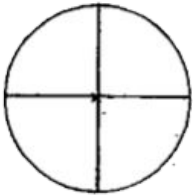
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10. What other name can you give to the line of symmetry of an isosceles triangle?

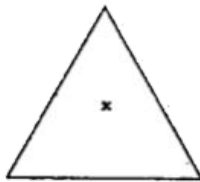
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Exercise 14 2

1. Which of the following figure, have rotational symmetry of order more than 1.



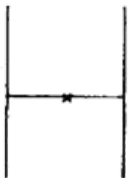
(a)



(b)



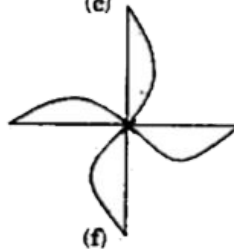
(c)



(d)



(e)



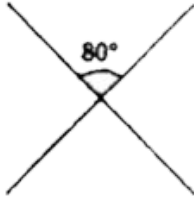
(f)

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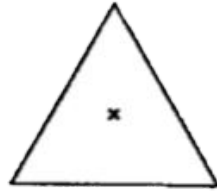
2. Give the order of rotational symmetry for each figure.



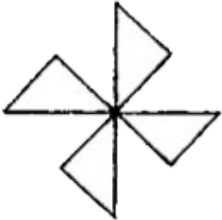
(a)



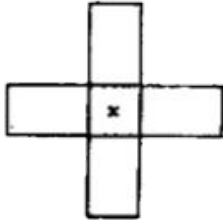
(b)



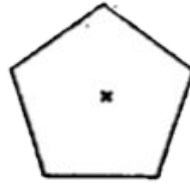
(c)



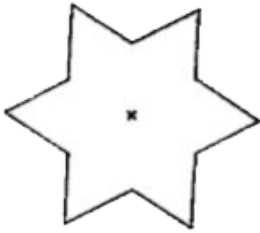
(d)



(e)



(f)



(g)



(h)



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



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2. Draw, wherever possible, a rough sketch of a triangle with both line and rotational symmetries of order more than 1.



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



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4. Fill in the blanks

Shape	Centre of rotation	Order of rotation	Angle of rotation
Square Rectangle Rhombus Equilateral triangle Regular Hexagon Circle Semicircle			



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



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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



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

(i) 45°

(ii) 17° ?

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Additional Questions For Practice Objective Type Question Fill In The Blanks

1. Angle of rotation in a regular pentagon is .

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2. Draw, wherever possible, a rough sketch of
a triangle with both line and rotational symmetries of order more than 1.

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3. Hands of clock rotate in ----- direction.

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4. Quadrilateral have four lines of symmetry is a square.

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5. Number of times a figure fits on to itself in one full turn is called order of rotation.

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Additional Questions For Practice Objective Type Question True Or False

1. Equilateral triangle has one line of symmetry.

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2. Regular polygon have equal sides and equal angles.

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3. Isosceles triangle have line symmetry but no rotational symmetry.

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4. State true or false

Circle has no line of symmetry.



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5. State true or false

Order of rotational symmetry in a square is 2.



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6. A figure having no rotational symmetry can have two or more lines of symmetry.



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1. When the following angles are rotated through 360° , at what angles will there be rotational symmetry in the following :

- (a) Square
- (b) Rectangle
- (c) Equilateral triangle
- (d) Parallelogram
- (e) Regular hexagon
- (f) Regular Octagon



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2. Complete the table

Shape	Centre of rotation	Order of rotation	Angle of rotation
(a) Parallelogram			
(b) Circle			
(c) Rhombus			
(d) Semicircle			
(e) Equilateral triangle			
(f) Rectangle			



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3. Draw two figures which do not show rotational or reflection symmetry.



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4. Find the order of rotational symmetry for the following angle of rotation. Name the geometrical shapes on the basis of the number of sides.

(a) 90°

(b) 45°



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5. Draw two letters of the English alphabet which have

(a) both line as well as rotational symmetry

(b) line of symmetry but no rotational symmetry

(c) Rotational symmetry but no line of symmetry

(d) Neither line of symmetry nor rotational symmetry.



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Additional Questions For Practice Objective Type Question Long Answer Type Questions

1. At what angles will the fan blades show rotational symmetry, if the number of blades are (i) 4 (ii) 5

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2. Discuss the rotational symmetry and line of symmetry of equilateral triangle.

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3. Show that the English alphabet Z has rotational symmetry of order 2.

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Additional Questions For Practice Objective Type Question Hots

1. Can we have a rotational symmetry of order more than 1, where angle of rotation is (i) 22.5° (ii) 19° (iii) 17°

Can we have geometrical shape ?

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Sample Paper For Practice Fill In The Blanks

1. Order of rotational symmetry in an equilateral triangle is

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2. Order of rotational symmetry of a line segment is

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3. Rhombus is symmetric about each of its



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4.is the smallest angle through which shape is rotated that it lies on to itself after rotation.



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5. A regular polygon of n sides has Number of lines of symmetry.



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Sample Paper For Practice Fill In The Blanks

1. Rotating figure by 60° anticlockwise is equivalent to a clockwise rotation by



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Sample Paper For Practice True Or False

1. In a rectangle, angle of rotation is 90° .



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2. Semi-circle has rotational symmetry of order 2.



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3. Isosceles triangle have line symmetry but no rotational symmetry.



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4. Angle of rotation of a figure is obtained by dividing 360° by order of rotational symmetry.



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5. State true or false

Every shape has rotational symmetry of order 1.



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6. State true or false

Letter H has both reflection and rotational symmetry.



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[Sample Paper For Practice Match The Following](#)

1. Match the following

- | | |
|--|-----------------------------|
| (a) Line of symmetry in isosceles trapezium | – 90° |
| (b) Line of symmetry in circle | – 72° |
| (c) Angle of rotation in square | – Centroid |
| (d) Angle of rotation in regular pentagon | – Intersection of diagonals |
| (e) Centre of rotation in rhombus | – infinite |
| (f) Centre of rotation in equilateral triangle | – 1 |



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Sample Paper For Practice Answer The Following

1. What is the other name for lines of symmetry for

- (i) Isosceles triangle
- (ii) Circle



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



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3. Name the two geometrical shapes which have line of symmetry and no rotational symmetry.



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4. Name the two geometrical shapes which have no line of symmetry nor rotational symmetry.



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5. Name a shape which has rotational symmetry but not line of symmetry.



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6. Find the order of rotational symmetry for the angle of rotation 60° .

Name the figure and find the number of line of symmetry in it.



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7. At what angle will the fan blades show rotational symmetry, if the number of blades are 3 ? Draw figure also.



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8. How can you say that the figure possesses rotational symmetry of order 4.



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9. Draw two alphabets which show line of symmetry but no rotational symmetry.



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