7th Standard- Maths

Symmetry Class

Lines of Symmetry for Regular Polygons

Regular polygons have equal sides and equal angles. They have multiple (i.e., more than one) lines of symmetry. Each regular polygon has as many lines of symmetry as it has sides.

Regular Polygon	Regular Hexagon	Regular Pentagon	Square	Equilateral Triangle
Number of Lines of Symmetry	6	5	4	3

Rotational Symmetry

Rotation, like the movement of the hands of a clock, is called a clockwise rotation; otherwise, it is said to be anticlockwise.

When an object rotates, its shape and size do not change. The rotation turns an object about a fixed point. This fixed point is called the centre of rotation. The angle by which the object rotates is called the angle of rotation.

A half-turn means rotation by 180°; a quarter-turn means rotation by 90°.

Rotation may be clockwise or anticlockwise.

If, after a rotation, an object looks exactly the same, we say that it has rotational symmetry.

In a complete turn (of 360°), the number of times an object looks exactly the same is called the order of rotational symmetry. For example, the order of symmetry of a square is 4 while, for an equilateral triangle, it is 3.

Line Symmetry and Rotational Symmetry

Some shapes have only one line of symmetry, like the letter E;

Some have only rotational symmetry, like the letter S;

and some have both symmetries like the letter H.

The study of symmetry is important because of its frequent use in day-to-day life and more because of the beautiful designs it can provide us.

A figure is said to be symmetrical about a line l if it is identical on either side of l. In the adjoining figure, / is the line of symmetry or axis of symmetry.
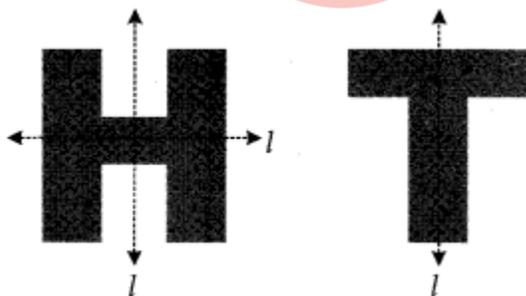
Regular polygons have equal sides and equal angles. They have multiple (i.e. more than one) lines of symmetry.

Each regular polygon has as many lines of symmetry as it has sides.

Lines of Symmetry of some Irregular Polygons.

Name of Polygon	Figure	Number of lines of Symmetry
Isosceles triangle		1
Rectangle		2
Kite		1
Trapezium		1
Circle		Infinite
Semi-circle		1
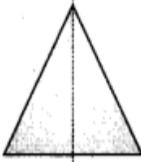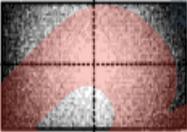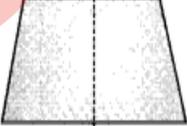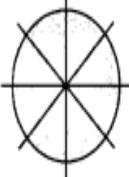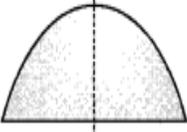
Each of the following capital letters of the English alphabet is symmetrical about the dotted line or lines as shown:
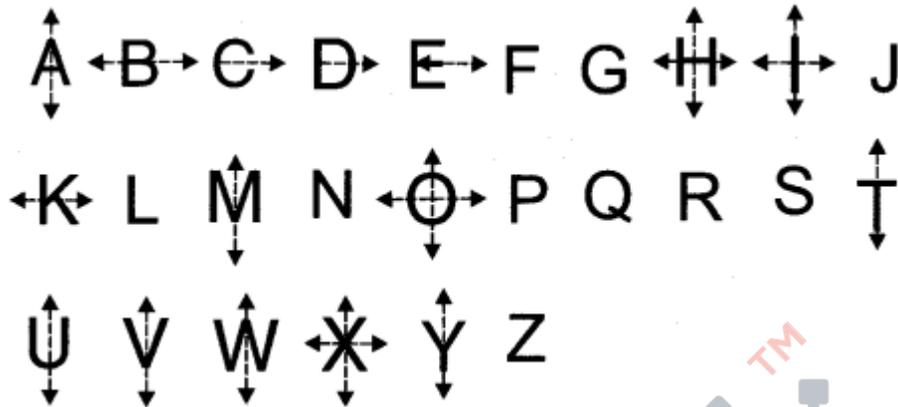
A figure is said to have rotational symmetry if, after a rotation, an object looks exactly the same.

The fixed point, about which the rotation turns an object (not changing its shape and size) is called centre of rotation.

In a complete turn (of 360°), the number of times an object looks exactly the same is called the order of rotational symmetry.

Figure Name	Line of Symmetry	Number of Symmetry	Rotational Symmetry	Centre of Rotation	Order of Rotational Symmetry
Square	Yes	4	Yes	Point of intersection of diagonals	4

Rectangle	Yes	2	Yes	Intersection of diagonals	2
Equilateral triangle	Yes	3	Yes	Centroid	3
Regular Hexagon	Yes	6	Yes	Centre of the Hexagon	6
Circle	Yes	Infinite	Yes	Centre	Infinite
Parallelogram	No	0	Yes	Intersection of diagonals	2
Rhombus	Yes	2	Yes	Intersection of diagonals	2