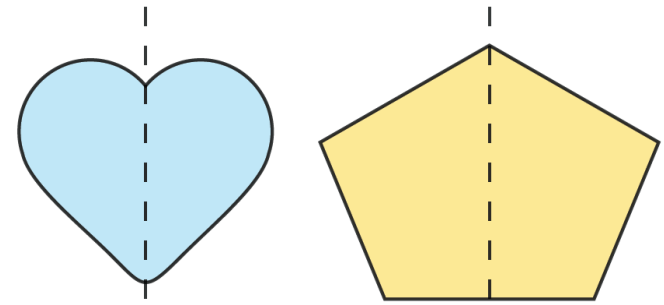
L-16 SYMMETRY

A shape is said to be symmetric if it can be divided into two more identical pieces which are placed in an organized way. The definition of Symmetry in Math, states that “symmetry is a mirror image”, i.e., when an image looks identical to the original image after the shape is being turned or flipped, then it is called symmetry.

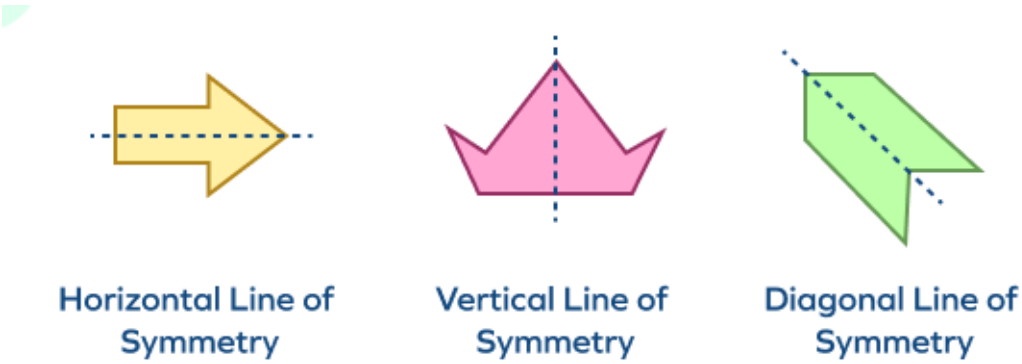


An object that is not symmetric is said to be asymmetric. That means that an asymmetric object cannot be divided into identical halves.

Line of Symmetry

The line of symmetry is a line that divides an object into two identical pieces. The line of symmetry can be categorized based on its orientation as:

- Vertical Line of Symmetry
- Horizontal Line of Symmetry
- Diagonal Line of Symmetry



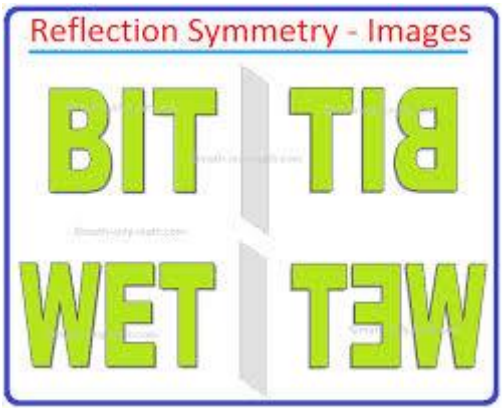
A line of symmetry is an axis along which an object when cut, will have identical halves. These objects might have one, two, or multiple lines of symmetry.

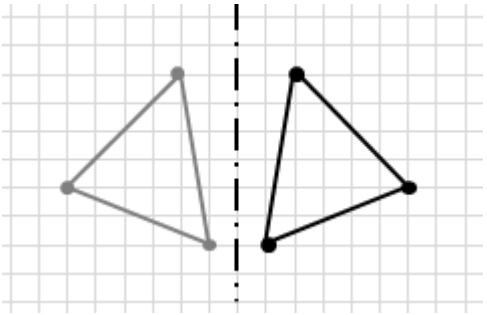
- One line of symmetry
- Two lines of symmetry
- Infinite lines of symmetry

Number of lines of symmetry	Examples of figures
No line of symmetry	Scalene triangle
Exactly one line of symmetry	Isosceles triangle
Exactly two lines of symmetry	Rectangle
Exactly three lines of symmetry	Equilateral triangle

Reflection Symmetry

Reflection symmetry, also called mirror symmetry, is a type of symmetry where one half of the object reflects the other half of the object. For example, in general, human faces are identical on the left and right sides. If we place a mirror along the line at the middle, the half part of, the object reflects through the mirror by creating the identical half with the remaining side.





Important Notes

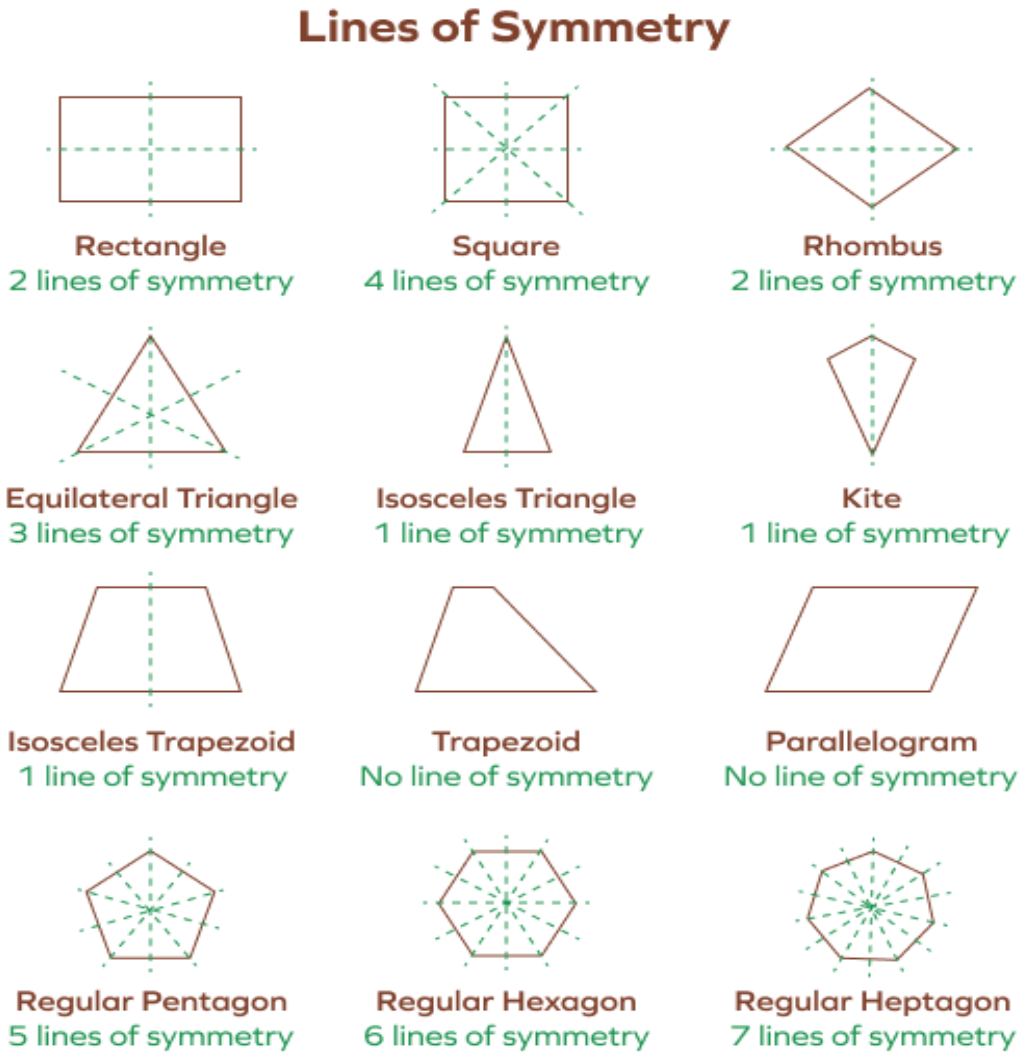
- All regular polygons are symmetrical in shape.
- An object and its image are symmetrical with respect to its mirror line.
- Reflection symmetry can also be observed in inkblot paper.
- A figure can have one or more lines of reflection symmetry depending on its shape and structure.

Symmetry in Real Life

We can observe symmetry around us in many forms:

- Trees reflected in crystal clear water and towering mountains reflected in a lake.
- The feathers of a peacock and the wings of butterflies and dragonflies have identical left and right sides.
- Hives of honeybees are made of hexagonal shape, which is symmetric in nature.
- Snowflakes in winter have all three lines of symmetry.

Lines of Symmetry of Geometrical Shapes



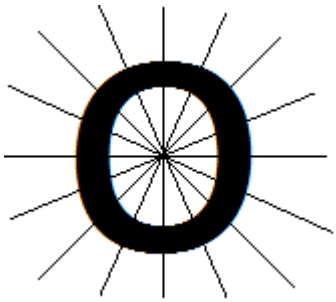
Line of Symmetry in Alphabets

(a) The following letters have vertical lines of symmetry: A, H, I, M, O, T, U, V, W, X, and Y.

(b) The following letters have horizontal lines of symmetry: B, C, D, E, H, I, K, O, and X.

(c) The following letters have no lines of symmetry: F, G, J, L, N, P, Q, R, S, and Z.

The alphabet ‘O’ has an infinity line of symmetry.
Infinity means that the number of lines of the letter O cannot be counted.



Exercise Problems

Solve Ex 16.1 Problems from Q1 to Q8.

Fill in the blanks from Mental Maths (Pg 254,255)