Basic Geometrical Figures

Basic geometrical figures are fundamental shapes and structures used in mathematics to study properties of space and measurements. They include points, lines, angles, and various shapes.

1. Point

A point is a small dot that represents a location. It has no size, length, or width.

- **Notation:** Points are labeled with capital letters (A, B, C, etc.).

Example: The tip of a pen, stars in the sky.

2. Line

A line is a straight path that extends infinitely in both directions.

- **Notation:** Represented by two capital letters (AB) with a line symbol above: ↔.

Example: A railway track, edges of a ruler.

Types of Lines

i. **Straight Line:** Extends in one direction without bending.

ii. **Curved Line:** A line that bends or turns.

iii. **Horizontal Line:** Runs from left to right.

iv. **Vertical Line:** Runs from top to bottom.

v. **Oblique (Slanting) Line:** A line that is neither horizontal nor vertical.

3. Line Segment

A line segment is a part of a line with two fixed endpoints.

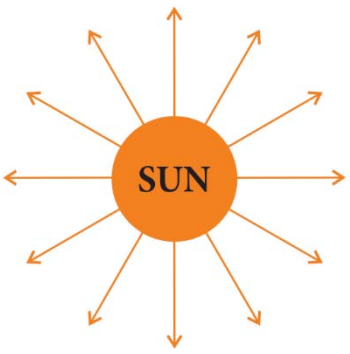
- **Notation:** Represented as AB (without arrows).

Example: The sides of a book, a table edge.

4. Ray

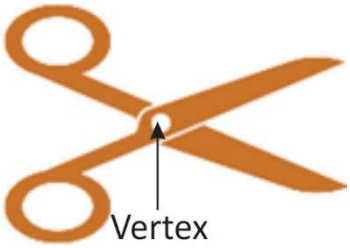
A ray is a part of a line that has one fixed endpoint and extends infinitely in one direction.

- **Notation:** Represented as → above two capital letters.



Example: Sunlight, torchlight.

5. Angle



An angle is formed when two rays meet at a common point (vertex).

- **Notation:** ∠ABC (where B is the vertex).

  Example: The hands of a clock, scissors.

Types of Angles

i. **Acute Angle:** Less than 90° (e.g., 30°, 45°).

ii. **Right Angle:** Exactly 90° (like a square corner).

iii. **Obtuse Angle:** More than 90° but less than 180°.

iv. **Straight Angle:** Exactly 180° (a straight line).

v. **Reflex Angle:** More than 180° but less than 360°.

vi. **Complete Angle:** Exactly 360° (full rotation).

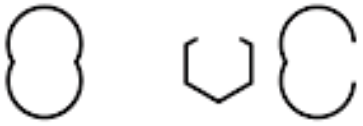
6. Plane

A plane is a flat surface that extends infinitely in all directions.

Example: A whiteboard, a sheet of paper.

7. Closed and Open Figures

- **Closed Figure:** A shape where the boundary is complete (e.g., square, circle).
- **Open Figure:** A shape where the boundary is not fully connected (e.g., an incomplete triangle).



8. Common Geometrical Figures

Shape	Properties	Example
Triangle	3 sides, 3 angles	Roof of a house
Square	4 equal sides, 4 right angles	Chessboard square
Rectangle	Opposite sides equal, 4 right angles	Book, mobile screen
Circle	No sides, curved shape, center	Wheel, coins
Pentagon	5 sides, 5 angles	Home plate in baseball
Hexagon	6 sides, 6 angles	Honeycomb

Properties of Basic Geometrical Figures

i. A line extends infinitely, but a line segment has a fixed length.
ii. A ray starts from one point and extends infinitely in one direction.
iii. A plane extends in all directions without an end.
iv. The sum of angles in a triangle is always 180°.
v. All squares have equal sides and four right angles (90°).
vi. All circles have equal radius from the center.