

Chapter 4: Basic Geometrical Ideas - Class 6 Mathematics Notes

Introduction

Geometry is the branch of mathematics that deals with shapes, sizes, and the properties of figures. This chapter introduces fundamental concepts like points, lines, angles, circles, and polygons.

1. Points, Line Segments, and Lines

Points

- A **point** represents a location in space and has no size.
- It is denoted by a capital letter, e.g., **A**, **B**, **C**.
- Example: A dot on paper represents a point.

Line Segment

- A **line segment** is the shortest distance between two points.
- It has a fixed length and is denoted as **AB**.
- Example: The edge of a table.

Line

- A **line** extends infinitely in both directions.
- It has no fixed length.
- It is represented as $\leftrightarrow \mathbf{AB}$.
- Example: Railway tracks.

Ray

- A **ray** starts from a point and extends infinitely in one direction.
 - It is denoted as $\rightarrow \mathbf{AB}$.
 - Example: Sunrays.
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2. Types of Lines and Angles

Types of Lines

- **Parallel Lines:** Two lines that never meet, e.g., railway tracks.

- **Intersecting Lines:** Two lines that meet at a point.
- **Perpendicular Lines:** Two lines that meet at 90° .

Types of Angles

- **Acute Angle:** Less than 90° .
 - **Right Angle:** Exactly 90° .
 - **Obtuse Angle:** Greater than 90° but less than 180° .
 - **Straight Angle:** Exactly 180° .
 - **Reflex Angle:** Greater than 180° .
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3. Circles and Polygons

Circles

- A **circle** is a closed curve where all points are equidistant from the center.
- **Parts of a Circle:**
 - **Center:** The middle point.
 - **Radius:** Distance from the center to any point on the circle.
 - **Diameter:** Longest chord, twice the radius.
 - **Chord:** A line joining two points on the circle.
 - **Arc:** A part of the circle.
 - **Sector:** A region enclosed by two radii.
 - **Segment:** A region enclosed by a chord.

Polygons

- A **polygon** is a closed figure made of straight lines.
 - **Types of Polygons:**
 - **Triangle:** 3 sides
 - **Quadrilateral:** 4 sides
 - **Pentagon:** 5 sides
 - **Hexagon:** 6 sides
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Summary

- ✓ Points, lines, and line segments form the basics of geometry.
- ✓ Different types of angles and lines help in understanding shapes.
- ✓ Circles have unique properties like radius, diameter, and chords.
- ✓ Polygons are closed figures with straight-line sides.