- Lines and angles are fundamental concepts in geometry. Understanding them is essential for solving various geometric problems.

1. Lines
A line is a straight one-dimensional figure having no thickness and extending infinitely in both directions.
Line Segment : A part of a line that is bounded by two distinct end points.
Ray: A line with a single endpoint (or point of origin) that extends infinitely in one direction.

2. Angles
Angle : An angle is formed when two rays originate from the same endpoint.
Vertex : The common endpoint of the rays forming an angle.
Arms : The two rays forming the angle.

Types of Angles

- Acute Angle : An angle less than 90 degrees.
- Right Angle : An angle exactly equal to 90 degrees.
- Obtuse Angle : An angle more than 90 degrees but less than 180 degrees.
- Straight Angle : An angle exactly equal to 180 degrees.
- Reflex Angle : An angle more than 180 degrees but less than 360 degrees.
- Complete Angle : An angle exactly equal to 360 degrees.

1. Complementary Angles
Two angles are complementary if their sum is 90 degrees.
Example: If one angle is 30 degrees, the other angle will be 60 degrees.

2. Supplementary Angles
Two angles are supplementary if their sum is 180 degrees.
Example: If one angle is 110 degrees, the other angle will be 70 degrees.

3. Adjacent Angles
Two angles are adjacent if they have a common arm and a common vertex, and they do not overlap.
Example: Angles formed by two intersecting lines.

4. Linear Pair
- A pair of adjacent angles whose non-common arms form a straight line (sum of angles is 180 degrees).

5. Vertically Opposite Angles
When two lines intersect, the angles opposite to each other are equal.
Example: If two lines intersect, they form two pairs of vertically opposite angles.

Parallel Lines and Transversals

- Parallel Lines : Two lines that never meet and are always equidistant from each other.
- Transversal : A line that intersects two or more lines at distinct points.

Angle Pairs formed by Parallel Lines and a Transversal

- Corresponding Angles : Angles in matching corners when a transversal intersects two parallel lines (equal).
- Alternate Interior Angles : Angles on opposite sides of the transversal but inside the two lines (equal).
- Alternate Exterior Angles : Angles on opposite sides of the transversal but outside the two lines (equal).
- Consecutive Interior Angles : Angles on the same side of the transversal and inside the two lines (sum is 180 degrees).

Important Points to Remember

- Sum of angles on a straight line is 180 degrees.
- Sum of angles around a point is 360 degrees.
- Vertically opposite angles are always equal.