

Chapter 5

Lines and Angles

- A Point means a location.
- A line is a straight that extends endlessly in both directions.



A line is denoted by \overleftrightarrow{AB}

- A line segment is the part of a line between two points.



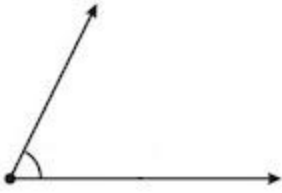
A line segment is denoted by \overline{AB}

- A ray is part of a line that starts at one point and extends endlessly in another direction.



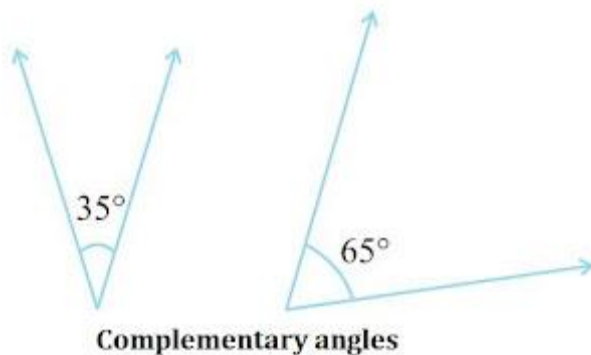
A ray is denoted by \overrightarrow{AB}

- An angle is formed when lines or line segments meet.

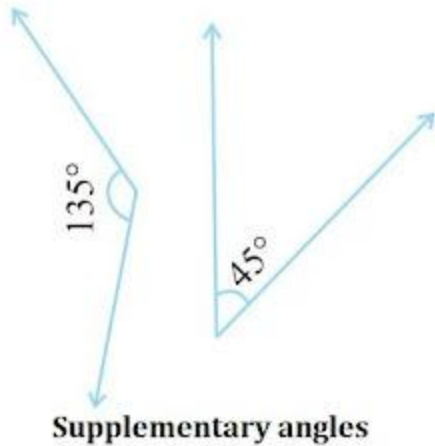


Related Angles

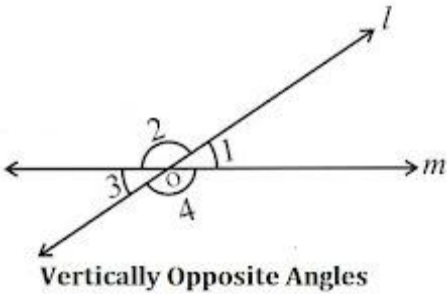
- When the sum of the measures of two angles is 90° , the angles are called complementary angles.
- Whenever two angles are complementary, each angle is said to be the complement of the other angle.



- When the sum of the measures of two angles is 180° , the angles are called Supplementary angles.
- When two angles are supplementary, each angle is said to be the supplement of the other.



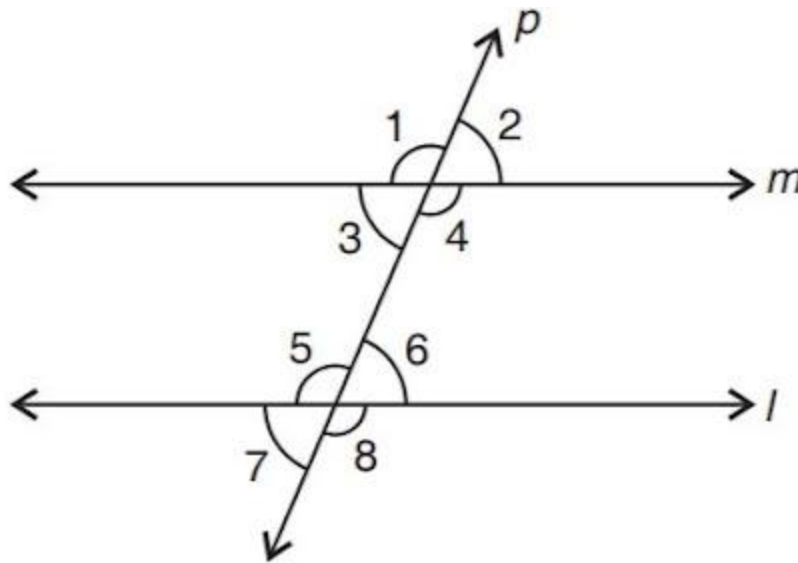
- Two angles with a common vertex and common arm but no common interior points are called Adjacent angles.
- These angles are such that:
 - (i) they have a common vertex;
 - (ii) they have a common arm; and
 - (iii) the non-common arms are on either side of the common arm.
- A linear pair is a pair of adjacent angles whose non-common sides are opposite rays.
- Vertically Opposite Angles: Two angles formed by two intersecting lines having no common arm. When two lines intersect, the vertically opposite angles so formed are equal.



Pair of Lines

- Intersecting Lines: Two or more lines that have one and only one point in common. The common point where all the intersecting lines meet is called the point of intersection.
- A line that intersects two or more lines at distinct points is called a transversal.
- Parallel lines: Two lines in the same plane that are at equal distance from each other and never meet.
- Alternate interior angle : The pair of angles on opposite sides of the transversal but inside the two lines are called alternate interior angles.
- Alternate exterior angle : The pair of angles on the opposite sides of the transversal but outside the two lines are called alternate exterior angles

- When two lines are intersected by a transversal, eight angles are formed.



Interior angles: $\angle 3, \angle 4, \angle 5, \angle 6$

Exterior angles: $\angle 1, \angle 2, \angle 7, \angle 8$

Pairs of corresponding angles: $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 3$ and $\angle 7$, $\angle 4$ and $\angle 8$

Pairs of Alternate interior angles: $\angle 3$ and $\angle 6$, $\angle 4$ and $\angle 5$

Pairs of Alternate exterior angles: $\angle 1$ and $\angle 8$, $\angle 2$ and $\angle 7$

Pairs of interior angles on the same side of the transversal: $\angle 3$ and $\angle 5$, $\angle 4$ and $\angle 6$.

Transversal of parallel lines

- If two parallel lines are intersected by a transversal, each pair of:

(i) corresponding angles are congruent

(ii) alternate interior angles are congruent

(iii) alternate exterior angles are congruent

(iv) interior angles on the same side of the transversal are supplementary.