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 $\overleftrightarrow{AB}$

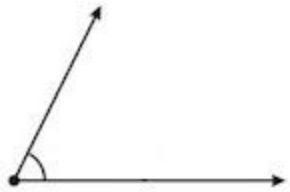
• A line segment is the part of a line between two points.

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 $\overrightarrow{AB}$

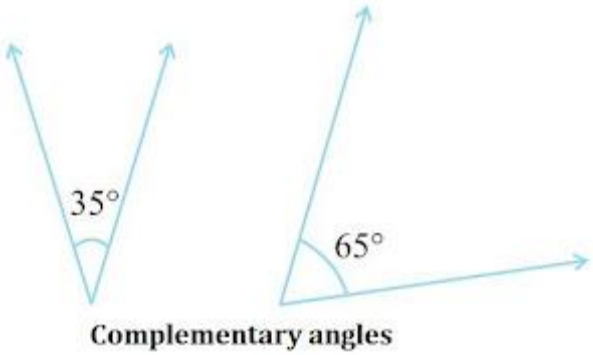
• An angle is formed when lines or line segments meet.



Related Angles

• When the sum of the measures of two angles is 90°, the angles are called complementary angles.

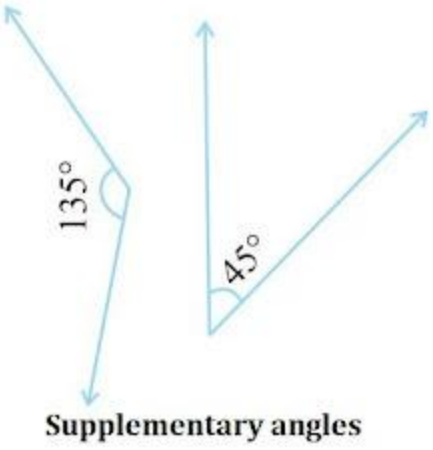
• Whenever two angles are complementary, each angle is said to be the complement of the other angle.



Complementary angles

• 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.



Supplementary angles

• Two angles with a common vertex and common arm but no common interior points are called Adjacent angles.

• These angles are such that:

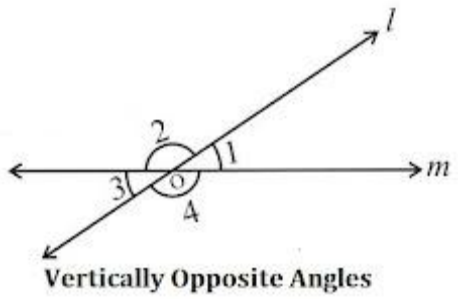
(i) they have a common vertex;

(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.



Vertically Opposite Angles

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.

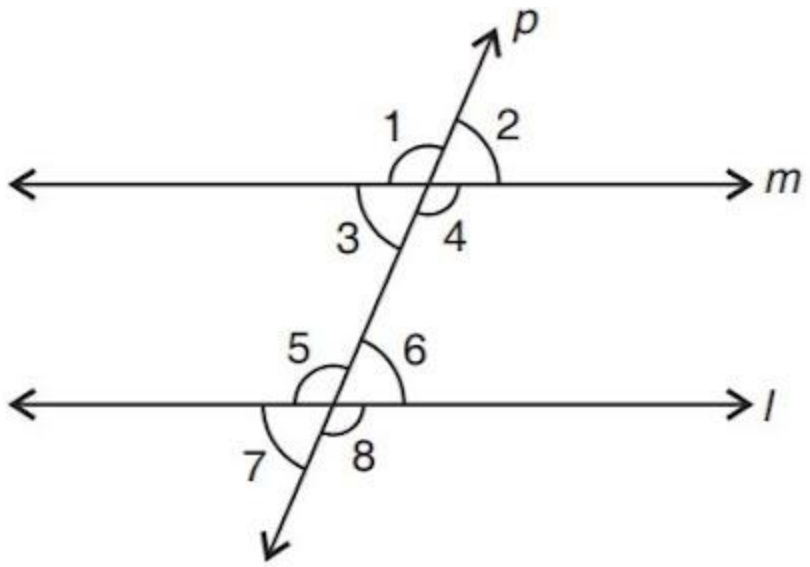
• Parallel lines: Two lines in the same plane that are at equal distance from each other and never meet.

• 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: ∠3, ∠4, ∠5, ∠6

Exterior angles: ∠1, ∠2, ∠7, ∠8

Pairs of corresponding angles: ∠1 and ∠5, ∠2 and ∠6, ∠3 and ∠7, ∠4 and ∠8

Pairs of Alternate interior angles: ∠3 and ∠6, ∠4 and ∠5

Pairs of Alternate exterior angles: ∠1 and ∠8, ∠2 and ∠7

Pairs of interior angles on the same side of the transversal: ∠3 and ∠5, ∠4 and ∠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.