

Introduction of Lines And Angles

Definitions :

1. **Point**: Any line segment whose length is zero units is called a point.
2. **Line**: A line which has no ends points and it is denoted by AB
3. **Ray**: Any line which has one end point is called a ray and its denoted by AB or BA
4. **Line segment**: Any line which has two end points is called a line segment and its denoted as by AB or BA.
5. **Angle**: When a ray is rotated on anti-clock wise direction, then the space which is obtained between the initial and the final ray is called a ray angle.

Note:

- * An angle has two arms
- * An angles has a vector

Types of Angles:

1. **Zero angle**: An angle whose measurement is 0 is called zero angle
2. **Acute angle**: An angle whose measurement is more than 0° and less than 90° is called acute angle.
3. **Right angle**: An angle whose measurement is exactly 90° is called a right angle.
4. **Obtuse Angle**: An angle whose measurement is more than 90° and less than 180° is called obtuse angle.
5. **Reflex angle**: A angle whose measurement is more than 180° and less than 360° is called reflex angle.
6. **Complete Angle**: A angle whose measurement is exactly 360° is called complete angle
Ex: 30° , 60° etc.
7. **Straight angle**: An angle whose measurement is exactly 180° is called straight angle.
8. **Complementary angles**: Two angle are said to be complementry angles if their sum is 90°
Ex: 30° , 60° and 45° , 45° etc.

9. **Supplementary Angles** : Two angles are said to be supplementary angle if their sum is 180° .
Ex: 100° and 80° , 10° and 170° etc.
10. **Adjacent Angles** : Two adjacent angles are said to be adjacent angles if they have a common vertex and common arm.
11. **Linear Pair Property** : The sum of the linear pair of angles is supplementary.
12. **Exterior Angle Property** : Each exterior angle of an angle is equal to the same sum of the opposite interior angles.
13. **Transversal** : A line which intersects two parallel lines at two distinct points is called a transversal.

Note :

- * If line intersects two parallel lines, then
- (a) 4 pair of corresponding angles are formed i.e. $\angle 1$ and $\angle 5$.
 - (b) 4 pair of corresponding angles are formed (i.e 2 points of alternate interior, 2 pairs of alternate exterior) i.e. $\angle 1$ and $\angle 7$, $\angle 2$ and $\angle 4$, $\angle 3$ and $\angle 5$, $\angle 4$ and $\angle 6$.
 - (c) 4 pairs of angles on the same side of the transversal are formed (2 points of interior, 2 pairs of exterior) i.e. $\angle 1$ and $\angle 8$, $\angle 2$ and $\angle 8$, $\angle 3$ and $\angle 6$, $\angle 4$ and $\angle 5$.
 - (d) Corresponding angles are equal, i.e. $\angle 1 = \angle 5$; $\angle 2 = \angle 6$, $\angle 3 = \angle 7$ and $\angle 4 = \angle 8$.
 - (e) Alternate angles are equals i.e. $\angle 1 = \angle 7$; $\angle 2 = \angle 8$, $\angle 3 = \angle 5$ and $\angle 4 = \angle 6$.
 - (f) Sum of interior and exterior angles on the same side of the transversal is equal to 180° i.e. $\angle 1 - \angle 8 = 180^\circ$; $\angle 2 - \angle 7 = 180^\circ$; $\angle 6 = 180^\circ$ and $\angle 4 - \angle 5 = 180^\circ$.
 - (g) If one pair of corresponding angles are equal or one pair of alternate angles are equal, then the two given lines are always parallel to each other.
 - (h) If the sum of one pair of interior angles on the same side of the transversal or exterior angles on the same side of the transversal is equal to 180° (supplementary) then the two given lines are parallel to each other.
