

## LINES AND ANGLES

### RELATED ANGLES (PAIRS OF ANGLES)

There are different types of pairs of angles. They are –

- (a) Complementary Angles
- (b) Supplementary Angles
- (c) Adjacent Angles
- (d) Linear Pair
- (e) Vertically Opposite Angles

### COMPLEMENTARY ANGLES

- 1) When the sum of the measures of two angles is  $90^\circ$ , the angles are called **complementary angles**. Example,  $55^\circ$  and  $35^\circ$  are complementary angles
- 2) Whenever two angles are complementary, each angle is said to be the **complement** of the other angle.
- 3) Two acute angles are complement to each other.
- 4) Two obtuse angles cannot be complement to each other. Also, two right angles cannot be complement to each other as their sum will be  $180^\circ$  and not  $90^\circ$ .

### SUPPLEMENTARY ANGLES

- 1) When the sum of the measures of two angles is  $180^\circ$ , the pair of angles are called **supplementary angles**.
- 2) When two angles are supplementary, each angle is said to be the **supplement** of the other.
- 3) Two obtuse angles or two acute angles cannot be supplementary.
- 4) Two right angles are supplementary as their sum is  $180^\circ$ .

## ADJACENT ANGLES

- 1) Adjacent angles are a pair of angles 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.

Hence, Adjacent angles have a common vertex and a common arm but no common interior points.

- 2) Two adjacent angles can be supplementary or complementary.
- 3) Two obtuse angles or two acute angles can be adjacent angles. Also, an acute angle can be adjacent to an obtuse angle.

## LINEAR PAIR

- 1) A **linear pair** is a pair of adjacent angles whose non-common sides are opposite rays.
- 2) Hence, a linear pair of angles are adjacent and supplementary.
- 3) Two acute angles or two obtuse angles cannot form a linear pair. However, two right angles form a linear pair, if they are adjacent also.

## VERTICALLY OPPOSITE ANGLES

- 1) When two lines intersect (looking like the letter X) we have two pairs of opposite angles. They are called *vertically opposite angles*.
- 2) Vertically opposite angles are equal in measure.