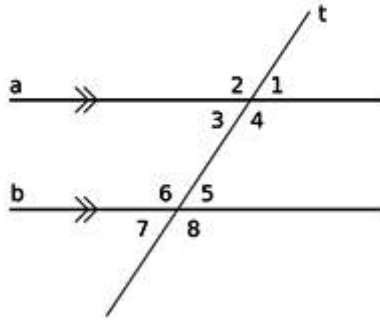


# Lines and Angles

## Parallel Lines and a Transversal

### Parallel lines with transversal



Parallel lines with a transversal

- $\angle 1 = \angle 5, \angle 2 = \angle 6, \angle 4 = \angle 8$  and  $\angle 3 = \angle 7$  (Corresponding angles)
- $\angle 3 = \angle 5, \angle 4 = \angle 6$  (Alternate interior angles)
- $\angle 1 = \angle 7, \angle 2 = \angle 8$  (Alternate exterior angles)

### Lines parallel to the same line

- Lines that are parallel to the same line are also parallel to each other.

## Introduction to Geometry

### Angles and types of angles

When 2 rays originate from the same point at different directions, they form an angle.

- The rays are called arms and the common point is called vertex
- Types of angles : (i) Acute angle  $0^\circ < a < 90^\circ$ 
  - (ii) Right angle  $a = 90^\circ$
  - (iii) Obtuse angle :  $90^\circ < a < 180^\circ$
  - (iv) Straight angle =  $180^\circ$
  - (v) Reflex Angle  $180^\circ < a < 360^\circ$
  - (vi) Angles that add up to  $90^\circ$  are complementary angles
  - (vii) Angles that add up to  $180^\circ$  are called supplementary angles.

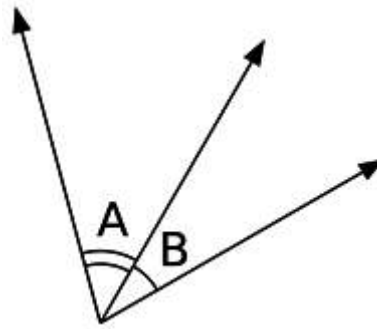
## Intersecting Lines and Associated Angles

### Intersecting and Non-Intersecting lines

- When 2 lines meet at a point they are called intersecting
- When 2 lines never meet at a point, they are called non-intersecting or parallel lines

## Adjacent angles

2 angles are adjacent if they have the same vertex and one common point.



Adjacent angles

## Linear Pair

When 2 adjacent angles are supplementary, i.e they form a straight line (add up to  $180^\circ$ ), they are called a linear pair.

## Vertically opposite angles

When two lines intersect at a point, they form equal angles that are vertically opposite to each other.

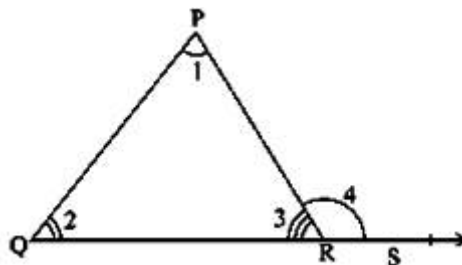
## Basic Properties of a Triangle

### Triangle and sum of its internal angles

Sum of all angles of a triangle add up to  $180^\circ$

### Exterior angle of a triangle = sum of opposite internal angles

- If a side of a triangle is produced, then the exterior angle so formed is equal to the sum of the two interior opposite angles



$\angle 4$  is the exterior angle

$$- \angle 4 = \angle 1 + \angle 2$$