

# 1. Basic Concepts in Geometry

- A **point** determines a location. The tip of a compass, the sharpened end of a pencil, the pointed end of a needle, etc., are the examples of points. Generally, points are denoted by capital letters.
- A **line segment** corresponds to the shortest distance between two points. The line segment joining the points P and Q is denoted as  $\overline{PQ}$ .



- A **ray** is a portion of a line, which starts at one point and goes endlessly in a direction.

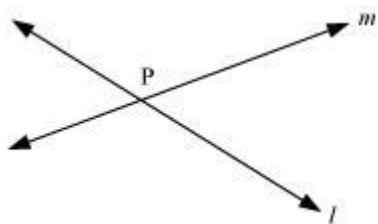


This ray is denoted as  $\overrightarrow{PQ}$ . Arrow head is towards Q since it is extended along Q.

- When a line segment PQ is extended indefinitely on both sides of points P and Q, it becomes a **line**,  $\overleftrightarrow{PQ}$ . Line is usually denoted by small letters  $l, m, n$ .



- Two lines  $l$  and  $m$  are said to be **intersecting lines**, if they intersect at a point.



- Two lines are said to be **parallel lines**, if they never intersect each other. We can represent the given lines as  $l \parallel m$ .



- A **plane** is a flat surface having length and width, but no thickness. We can say that a plane is a flat surface, which extends indefinitely in all directions. For example, surface of a wall, floor of a ground, etc.
- **Incidence properties in a plane:**
  1. An unlimited number of lines can be drawn passing through a given point.
  2. There is exactly one line passing through two distinct points in a plane.
  3. Points lying on the same line are known as collinear points and the points which do not lie on the same line are called non-collinear points.
  4. Three or more lines passing through a common point are known as concurrent lines and that point is known as point of concurrence.

