

Fundamental Concepts

- 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.

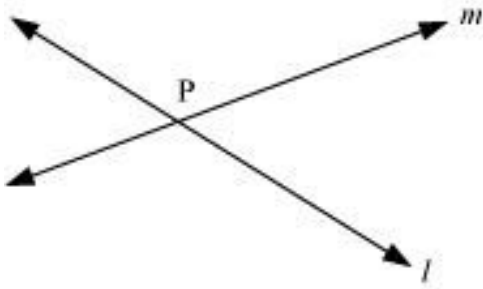


This ray is denoted as $\overrightarrow{PQ}$. Arrow head is towards Q since it is extended along Q.

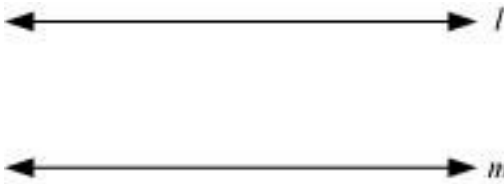
- When a line segment PQ is extended indefinitely on both sides of points P and Q, it becomes a **line**, $\overleftrightarrow{PQ}$. Line is usually denoted by small letters l, m, n .



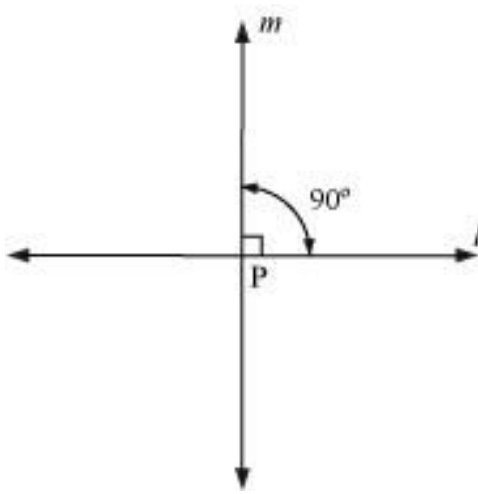
- Two lines l and m are said to be **intersecting lines**, if they intersect at a point.



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

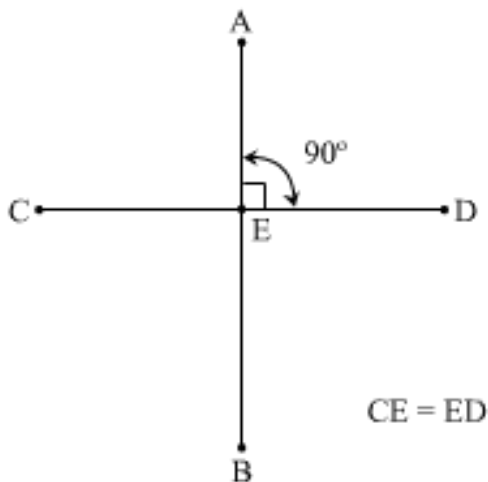


- A **plane** is a flat surface having length and width, but no thickness. We can say that a plane is a flat surface, which extends indefinitely in all directions. For example, surface of a wall, floor of a ground, etc.
- Incidence properties in a plane:**
 - An unlimited number of lines passing through a given point.
 - There is exactly one line passing through two distinct points in a plane.
 - 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.
 - Three or more lines passing through a common point are known as concurrent lines and that point is known as point of concurrence.
- Two lines are perpendicular, if the angle between them is 90° .



Here, lines l and m are perpendicular.

- A line segment AB is called the perpendicular bisector of line segment CD , if $\overline{AB}$ is perpendicular to $\overline{CD}$ and $\overline{AB}$ divides $\overline{CD}$ into two equal parts.



Here, line segment AB is the perpendicular bisector of line segment CD .

Curve:

Any drawing (straight or non-straight) done without lifting the pencil is called a **curve**. Line is also a curve.

The curve which does not intersect itself is called a **simple curve**.



2. A curve is said to be **closed**, if it has no starting or ending point.



3. A curve is said to be **open**, if its end points are not joined.

