# MATHEMATICS CLASS - VI



## 4. BASIC GEOMETRICAL IDEAS

By:- PRASHANT

The term Geometry is the English equivalent of the Greek word Geometron

Geo + metron

Geo → Earth

metron → Measurement

Any object which is present on earth has a shape which is defined by geometry.

### PLANE :→

A plane is a flat surface which extends indefinitely in all directions. It has no boundary.

### POINT :→

→ A Point is a mark of position.

→ A Point determines a location.

→ A point has no length, breadth or thickness.

### LINE SEGMENT :→

A straight path between two points is called line segment.


here

$\overline{AB}$ is a line segment.

It is denoted by $\overline{AB}$ or $\overline{BA}$

A line segment has a definite length, which can be measured. It has two end points.

## RAY :→

A line segment extended endlessly in one direction is called a ray


It is denoted by $\overrightarrow{AB}$ (Ray AB)

→ A ray has only one end point, this point is known as initial point of ray.

→ A ray does not have a definite length.

## LINE :→

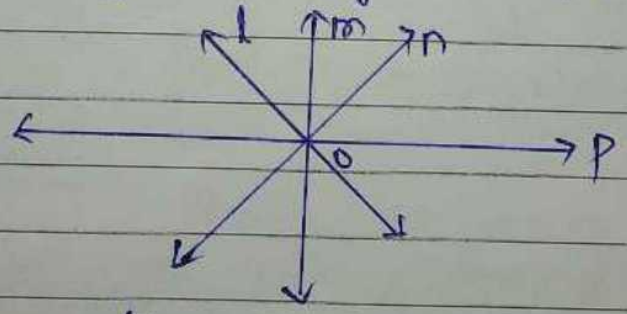
A line segment extended on both sides is called a line.


→ It is denoted by $\overleftrightarrow{AB}$ or $\overleftrightarrow{BA}$. It is also represented by a small letter l, m, n etc.

→ A line has no end points.

→ Two planes intersect in a line.

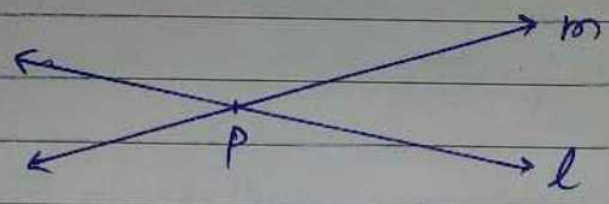
→ An unlimited number of lines can be drawn passing through a given point.




→ Only one line can be drawn passing through two different points.

## Intersecting lines :-

If two lines have one common point, they are called intersecting lines.

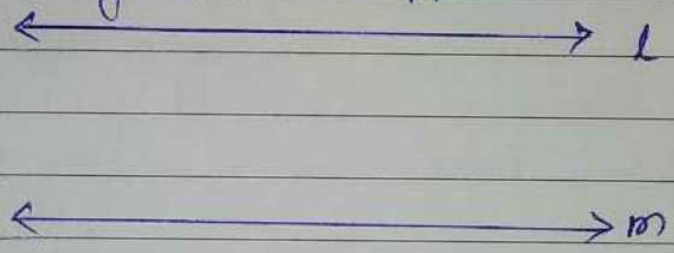



## Parallel lines :-

Lines which do not meet are said to be parallel lines.

Parallel lines never intersect.

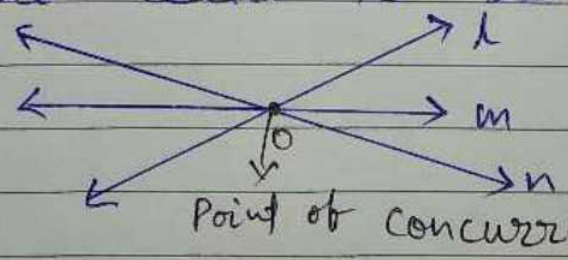
Ex :- Railway lines, opposite sides of a rectangle.




parallel lines.

## Concurrent lines :-

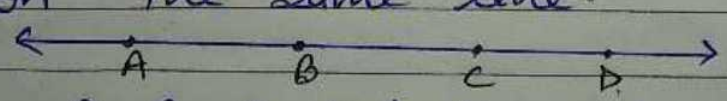
If more than ~~three~~ two lines passes through a common point, then these lines are said to be concurrent lines.




concurrent lines.

## Collinear points :-

Three or more points in a plane are said to be collinear if they all lie on the same line.




points A, B, C and D are collinear.

## CURVE :-

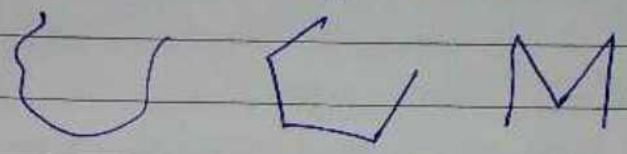
A set of points forming a continuous line is called a curve.

If a curve does not cross itself, then it is called a simple curve.

## Open curve :-

A curve in which the ends do not meet is called open curve

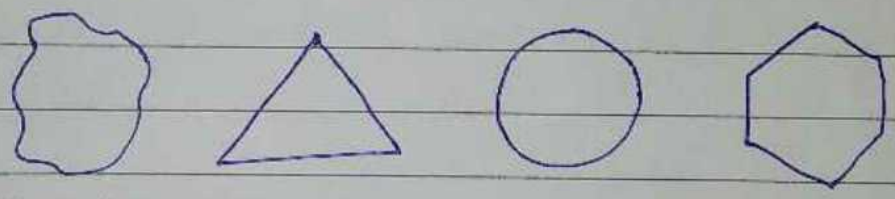
Ex :-



## Closed curve :-

A curve which begins and ends at the same points is called a closed curve.

Ex :-



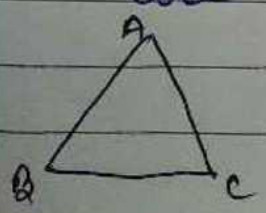
## Polygons :→

Simple closed curve made up entirely of line segments is known as ~~pto~~ polygon.

Ex :- Triangles, Quadrilaterals, Pentagons etc.

## Sides :-

The line segments forming a polygon are called its sides.




AB, BC and CA are sides.

## Vertex :-

The meeting point of a pair of sides is called its vertex.

## Adjacent sides of Polygon :-

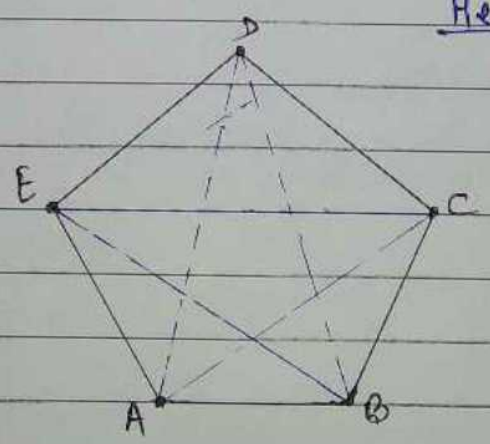
Any two sides with a common end point are called the Adjacent sides of the polygon.

## Adjacent vertices :-

The end points of the same side of a polygon are called the adjacent vertices.

## Diagonals of the Polygon :-

The line joining the non-adjacent vertices are called diagonals of the polygon.




Here,

A, B, C, D & E are vertices.

$\overline{AC}$, $\overline{AD}$, $\overline{BD}$, $\overline{BE}$ and $\overline{CE}$ are diagonals.

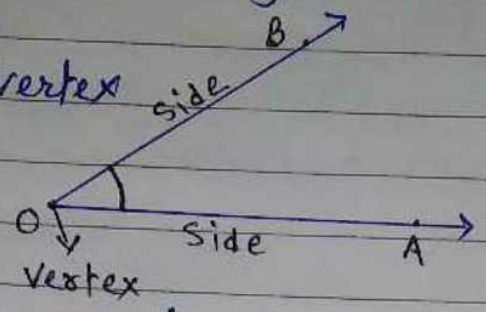
## ANGLE :-

An angle is made up of two rays starting from a common initial point. The common initial point is the vertex of the angle.

## Arms or sides of the angle:-

The two rays forming the angle are called the arms or sides of the angle.

Point O is vertex




$\overrightarrow{OA}$ and $\overrightarrow{OB}$ are sides of Angle.

Given Angle is represented as $\angle AOB$.

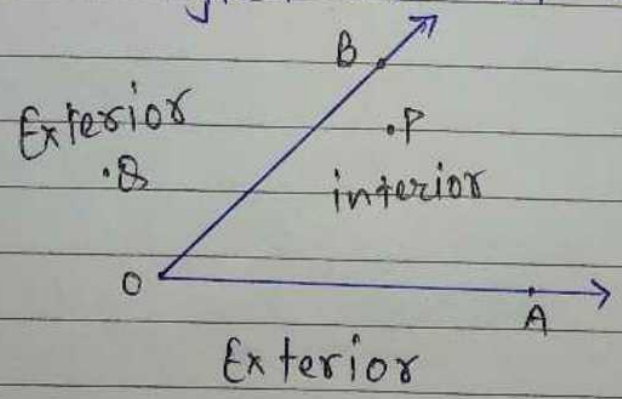
In specifying the angle, the vertex is always written as the middle letter.

## Interior of an angle:-

Those points which lie inside the angle, are at interior of an angle.

## Exterior of an angle:-

Those points which lie outside the angle, are at exterior of an angle.




An angle seperates its interior from its exterior.