

Tender Heart High School ; Sec- 33-B ; Chandigarh

Class- VI

Date- 20.05.24

Subject - Mathematics

Teacher- Ms. Sushma

Ch-14 Fundamental Geometrical Concepts

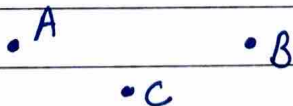
Introduction:-

The word geometry has been derived from two Greek words, namely, 'Geo' and 'metron'. Geo means earth and metron means measurement. Thus, the word geometry means, measurement of earth.

Point $\Rightarrow$ A point is an exact location on a plane.

They are usually named with a single letter, such as point A, B, C and so on. A point has neither length nor breadth nor depth (or thickness).

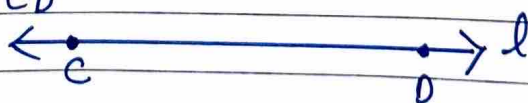
eg:-



Plane $\Rightarrow$ A plane is a flat two-dimensional surface that extends infinitely in every direction.

Line $\Rightarrow$ A line is a straight path which extends infinitely in both directions.

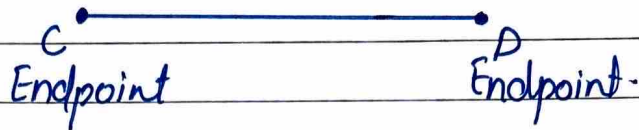
eg:- line l or $\overleftrightarrow{CD}$



Line Segments:-

A line segment is a part of a line with two endpoints.

eg:- $\overline{CD}$



Ray:->

A ray is a part of a line that starts with one endpoint and extends infinitely in one direction.

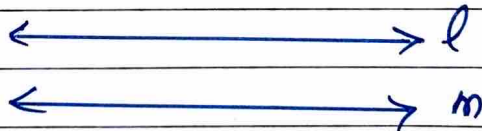
eg:- $\overrightarrow{AB}$



Parallel lines:->

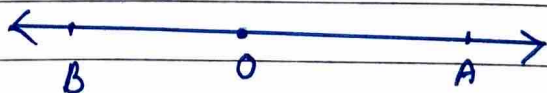
Parallel lines are lines that are always the same distance apart and never meet.

eg:- $l \parallel m$



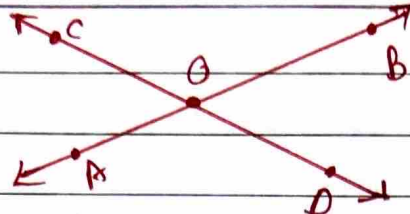
Opposite Rays:->

Two rays with the same initial point and extending indefinitely in opposite directions along the same line, are called opposite rays. $\overrightarrow{OA}$ and $\overrightarrow{OB}$ are opposite rays.



Intersecting lines:->

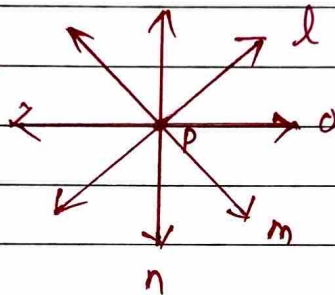
Two lines having a common point are called intersecting lines.



The lines AB and CD intersect at a point O.

Concurrent Lines:-

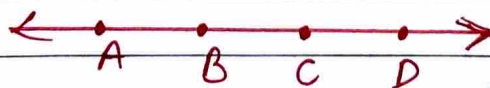
Three or more lines in a plane are said to be concurrent if all of them pass through the same point.



the lines o, l, m, n are concurrent line.
point P is called the point of concurrence.

Collinear Points:-

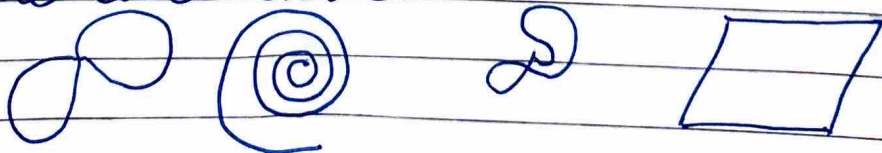
Three or more points in a plane are said to be collinear if all of them lie on the same straight line.



All the four points A, B, C, D are collinear.

Curves:-

The figures traced out with the help of the sharp edge of a pencil without lifting the pencil are called curves.



Closed and open figures:->

A figure which begins and ends at the same point is called a closed figure.

A figure which does not end at the starting point is called an open figure.

Polygons:-

A simple closed figure formed of three or more line segments is called a polygon.

A polygon with 3 sides is called a triangle.

A polygon with 4 sides is called a quadrilateral.

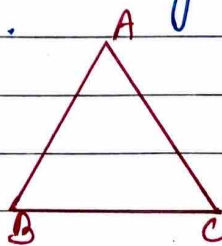
A polygon with 5 sides is called a pentagon.

Plane figures:-

We draw figures such as a triangle, a rectangle, a square, and a circle, etc. We call these figures as plane figures.

Triangle:-

A figure bounded by three line segments is called a triangle.



3 → vertices, A, B, C

3 → sides, AB, BC and AC

Quadrilateral:->

A figure formed by four line segments is called a quadrilateral.

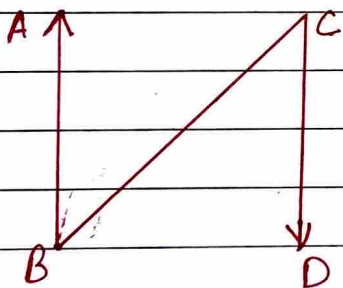
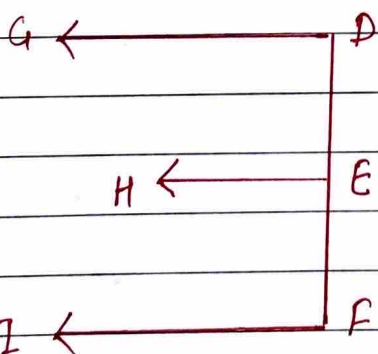
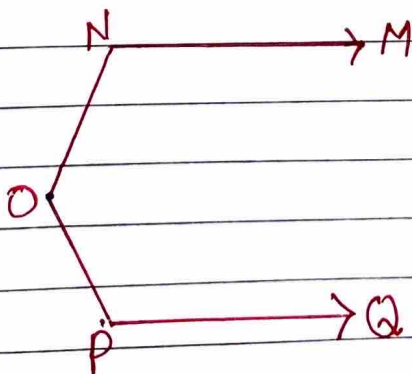
Types of Quadrilaterals.

1. Rectangle
2. Square
3. Parallelogram
4. Rhombus

Exercise 14A

1. Identify the line segments and rays and name them in the following figures:-

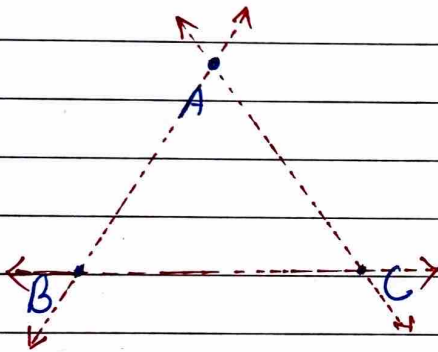
(i)

Line Segments - $\overline{BC}$ Ray - $\overrightarrow{BA}$, $\overrightarrow{CD}$ Line Segments - $\overline{DE}$, $\overline{EF}$, $\overline{DF}$ Rays - $\overrightarrow{DG}$, $\overrightarrow{EH}$, $\overrightarrow{FI}$ Line Segments - $\overline{ON}$, $\overline{OP}$ Rays - $\overrightarrow{NM}$, $\overrightarrow{PQ}$

Q2(i) Mark three points which are collinear.



(ii) Mark three points which are non-collinear. Draw lines through these points taking two at a time and name these lines. How many such different lines can be drawn?

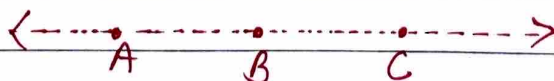


Three different lines can be drawn.

3(i) How many lines can be drawn passing through three collinear points?

One line or a single line can be drawn through three collinear points.

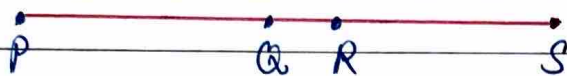
(ii) Given three collinear points A, B, C. How many line segments do they determine? Name them.



3 line segments $\overline{AB}$, $\overline{BC}$, $\overline{AC}$

Q. Count the number of line segments drawn in each of the following figures and name them.

(i)



$\overline{PQ}$, $\overline{QR}$, $\overline{RS}$, $\overline{PR}$, $\overline{PS}$, $\overline{QS}$ — 6 line segments

Q. Fill in the blanks:-

- i) A line segment has two end points.
- ii) A line has no end points.
- iii) A ray has one end points.
- iv) A line segment has a definite length.
- v) A line AB is represented by $\overleftrightarrow{AB}$.
- vi) A ray AB is represented by $\overrightarrow{AB}$.
- vii) A point shows a definite position.
- viii) Two lines intersect in a point.
- ix) Two planes intersect in a line.
- x) The minimum no. of points of intersection of three lines in a plane is 0.