



মণিপুরৰ শিক্ষা বিভাগ (সংসদ)

DEPARTMENT OF EDUCATION (S)

Government of Manipur

Chapter 4: Basic Geometrical Ideas

Notes:

The term 'Geometry' is the English equivalent of the Greek word 'Geometron'. 'Geo' means Earth and 'metron' means Measurement.

Point: Point determines location.

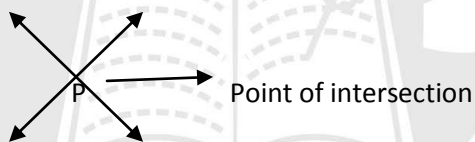


Shortest distance between point A and point B is a line segment and denoted by \overline{AB} .



A line through two points A and B can be extended in both directions. It can be denoted by letter like l, m

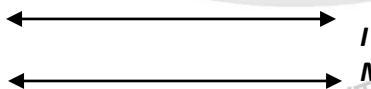
Intersecting Lines:



Parallel lines: Parallel lines are the lines which do not meet at any point if extended indefinitely on both sides.



We write $\overline{AB} \parallel \overline{CD}$

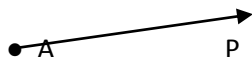


We write $\overline{l} \parallel \overline{m}$

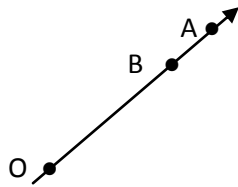


Example: The opposite edges of ruler.

Ray: A ray is a portion of a line, starting at one point and goes endlessly in a direction.



Here, A is the starting point and P is a point on the path of the ray \overrightarrow{AP}



Here, \overrightarrow{OA} passes through point B also. So it can be named \overrightarrow{OB} also. \overrightarrow{OA} and \overrightarrow{OB} are the same as A and B lie on the same ray.

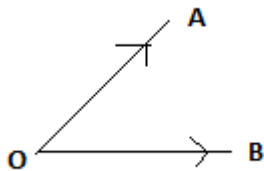
Curve: It is a drawing which is done without lifting the pencil.



Closed and open curves: A curve is closed if its ends are joined. Otherwise, it is an open curve.

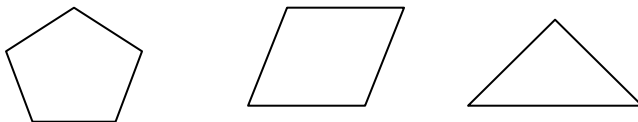


Angle: It is made up of two rays which are starting from a common point.



Two rays starting from a common initial point form an angle. Here, \overrightarrow{OA} and \overrightarrow{OB} with common initial point O form an angle $\angle AOB$. \overrightarrow{OA} and \overrightarrow{OB} are called the arms. O is the vertex of the angle.

Polygons: A polygon can be defined as a closed curve which is made up of line segments.



Remark: Any two line segments cannot form a closed figure.

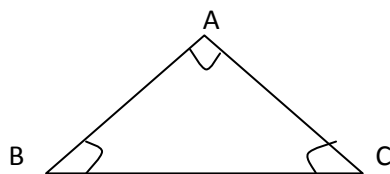
Sides of a polygon: The line segments are known as the sides of the polygon.

Vertex: Vertex is the meeting or intersecting point of a pair of sides.

Adjacent sides: Two sides having the same endpoint are called adjacent sides.

Diagonal: Diagonal is obtained by joining any two non-adjacent vertices of a polygon.

Triangle: A triangle is a three sided polygon. A simple closed figure made up of three line segments is called a triangle.

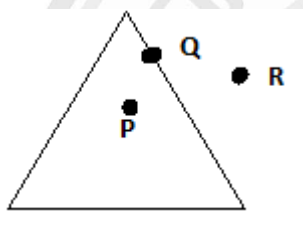


Here, ABC is a triangle and we write it as $\triangle ABC$.

It has three sides AB, BC and CA.

Three vertices A, B and C and three angles namely $\angle ABC$, $\angle BCA$ and $\angle CAB$.

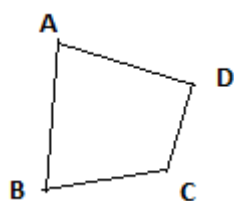
A triangle has an exterior and interior.



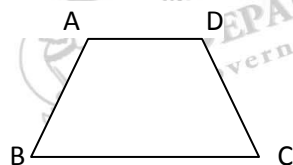
In the figure, we have P is in the interior of the triangle. R is in the exterior of the triangle and Q is on the triangle.

Quadrilateral:

A four sided polygon is called a quadrilateral. It has four sides and four angles.



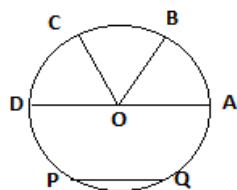
The four sides are AB, BC, CD and DA and 4 angles are $\angle A$, $\angle B$, $\angle C$ and $\angle D$. A quadrilateral has 2 pairs of adjacent sides and 2 pairs of opposite sides. It has 2 pairs of opposite angles and 2 pair of adjacent angles.



\overline{AD} and \overline{BC} are opposite sides. Also, \overline{AB} and \overline{DC} are opposite sides. $\angle A$ and $\angle C$ are opposite angles and also, $\angle B$ and $\angle D$ are opposite angles. $\angle B$ and $\angle C$ are adjacent angles.

Circle:

A circle is a simple curve which is not a polygon. Every point on a circle is at equal distance from a fixed point called a centre.



In the above figure, O is the centre of the circle. A, B, C, D are points on the circle and $OA = OB = OC = OD$. Each of the line segments \overline{OA} , \overline{OB} , \overline{OC} , \overline{OD} is called radius of the circle. \overline{AD} is known as diameter of the circle. \overline{PQ} is chord connecting two points on a circle. The longest chord of a circle is its diameter. The distance around a circle is its circumference. A semi circle is half of a circle.



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