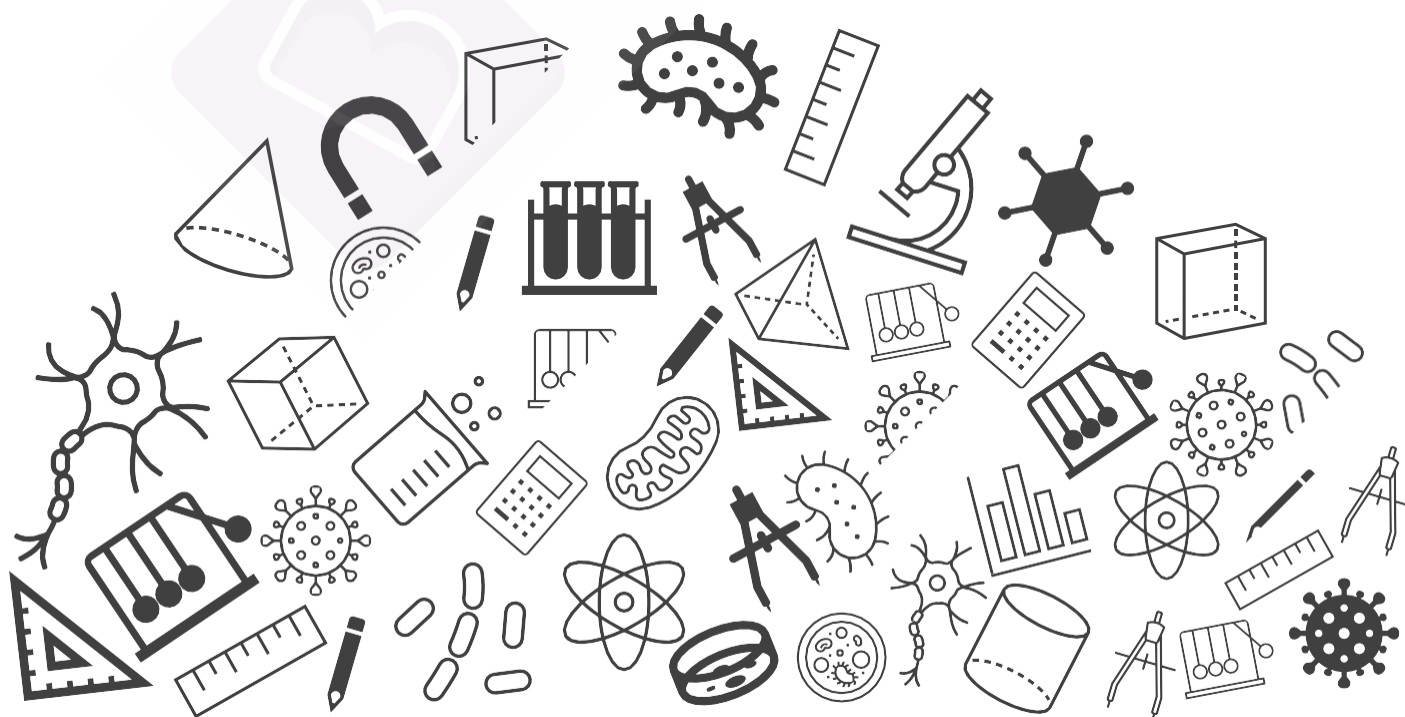




Grade 06

Maths Chapter Notes

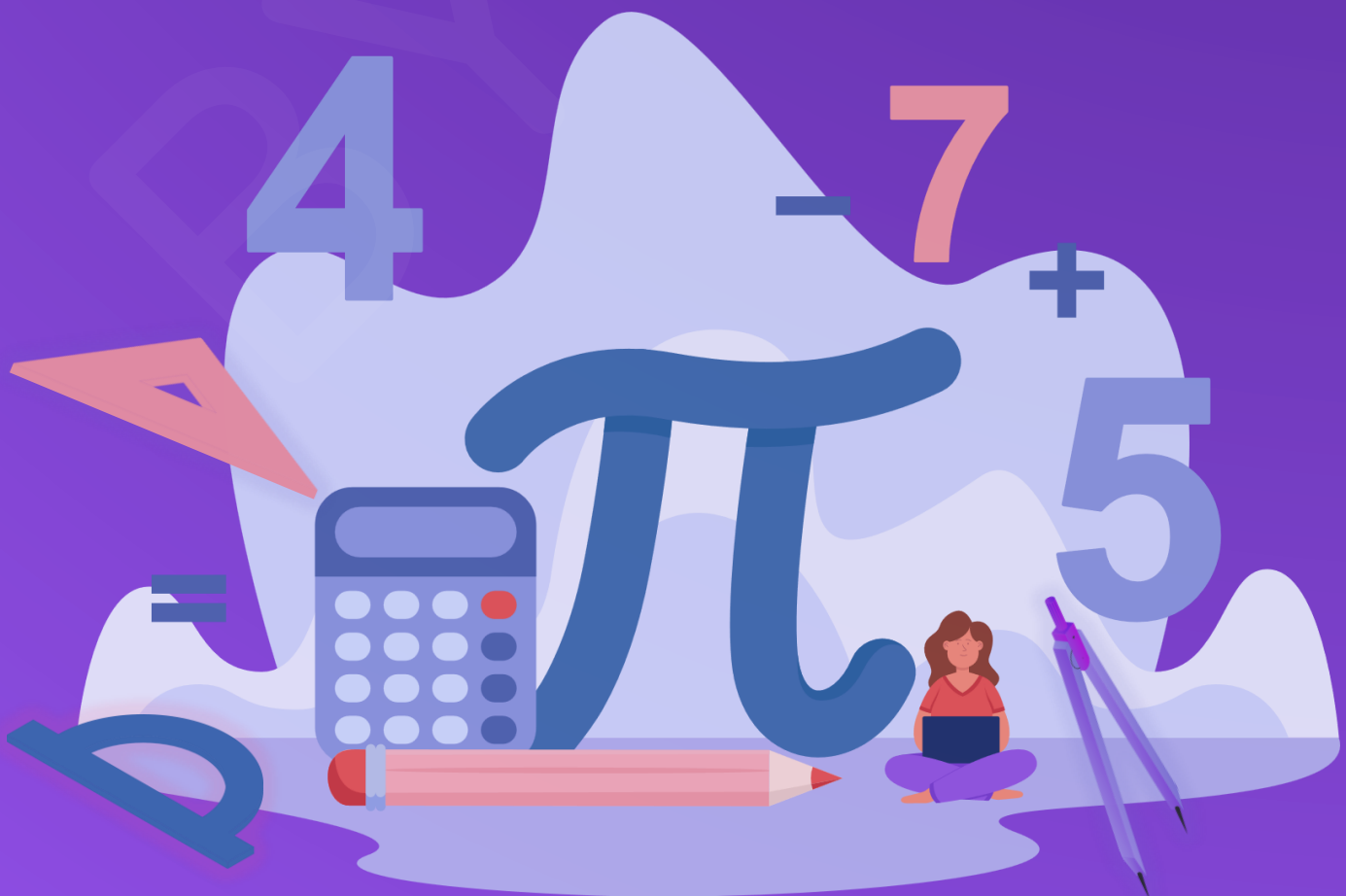


BYJU'S Classes

Chapter Notes

Basic Geometrical Ideas

Grade 06



Topics to be Covered

1. Introduction

2. Basic Geometrical Shapes

- 2.1. Point
- 2.2. Line segment
- 2.3. Line
- 2.4. Ray

3. Types of Lines

- 3.1. Intersecting lines
- 3.2. Parallel lines

4. Curves

5. Angles

6. Polygons

7. Circles

1. Introduction

Geometry

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



Geometrical ideas are reflected in all forms of art, measurements, architecture, engineering, cloth designing, etc.

2. Basic Geometrical Shapes

2.1. Point

- A point determines a location.
- Points are generally represented as:

• • •
A B C

These are read as point A, point B, and point C.

2. Basic Geometrical Shapes

2.1. Line Segment

- A line segment is a one-dimensional figure which describes a path between two points.
- A line segment is represented as \overline{XY} (shortest path between points X and Y). The points X and Y are called the end points of the line segment.



Two points (X and Y) are required to draw a line segment.

2.2. Line

- By extending a line segment indefinitely on both sides, a line is obtained.
- A line extends indefinitely in both directions. So, it contains a countless number of points.

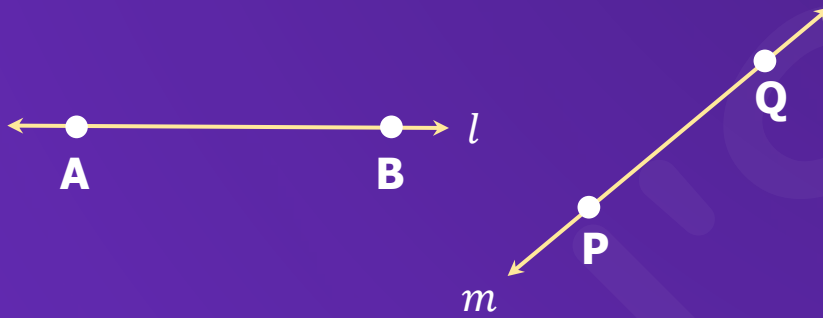


Two points (X and Y) are required to draw a line.

2. Basic Geometrical Shapes



Sometimes a line is denoted by letters like l , m , etc.



2.2. Ray

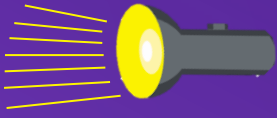
A ray is a portion of a line. It starts at one point (starting point or initial point) and goes endlessly in a direction.



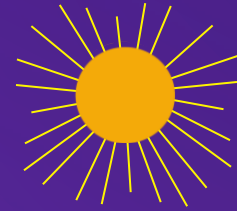
- Fixed point **is P**.
- Extends endlessly and passes through point Q.
- The arrow head is represented above Q and not P, because P is the fixed point.

2. Basic Geometrical Shapes

Examples of rays:



Rays from a torch



Sun rays

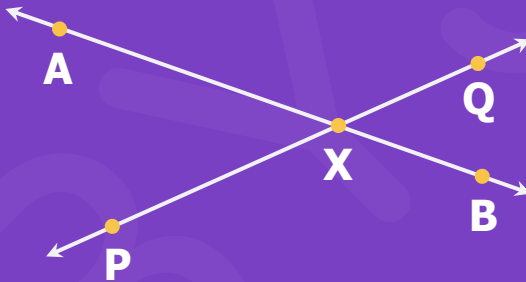


Beam of light from light house

3. Types of Lines

3.1. Intersecting Lines

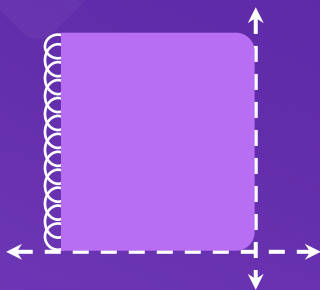
When two lines have only one common point, they are called intersecting lines.



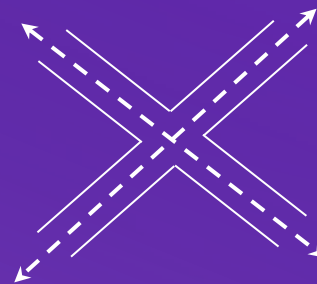
Point of intersection: **X**

Lines: \overleftrightarrow{AB} and \overleftrightarrow{PQ}

Examples of intersecting lines:



Two adjacent edges of your notebook



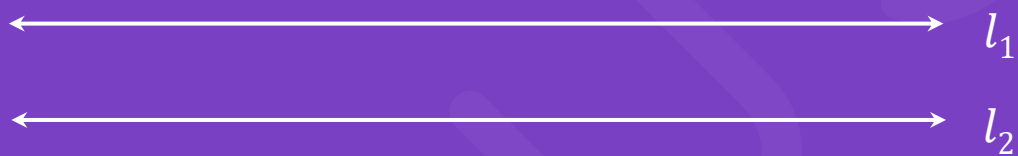
Crossing-roads

3. Types of lines

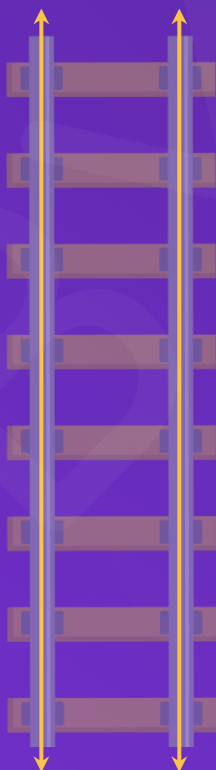
3.2. Parallel lines

- Parallel lines are lines which never intersect anywhere in a plane.
- If two lines AB and CD are parallel, it can be represented as $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.

Similarly, if two lines l_1 and l_2 are parallel, we write $l_1 \parallel l_2$



Parallel lines



Parallel lines

Lie on the same plane

Never intersect
(even when extended)

Distance between them
remains same

4. Curves

- A curve is a shape or a line which is smoothly drawn in a plane having a bent or turns in it.
- A curve that changes its direction but does not intersect itself is known as a **simple curve**.
- A simple curve can be open or closed.

Types of Curves

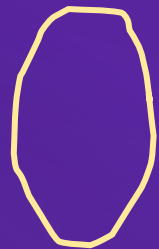
Open Curve

- A curve with two endpoints.
- It does not enclose the area within itself.

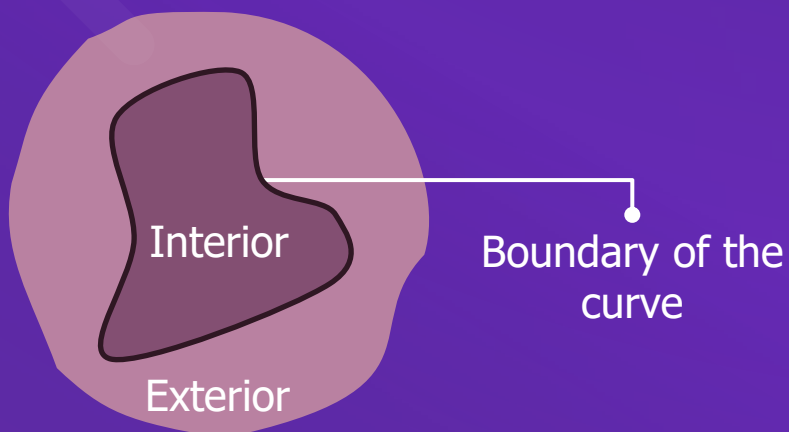


Closed Curve

- A curve with no endpoints.
- It encloses the region or area within itself.



Position in a figure



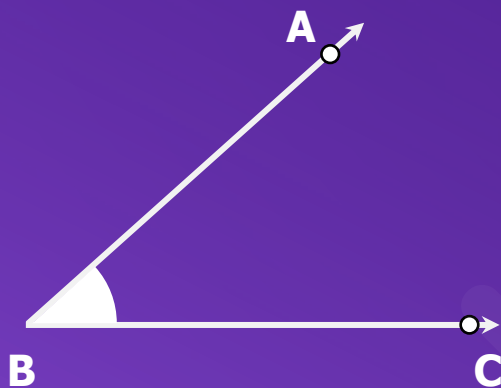
In a **closed curve**, there are three parts.

- interior ('inside') of the curve. [also called as **region**]
- boundary ('on') of the curve.
- exterior ('outside') of the curve.

5. Angles

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

- The two rays forming the angle are called the **arms or sides** of the angle.
- The common initial point is the **vertex** of the angle.



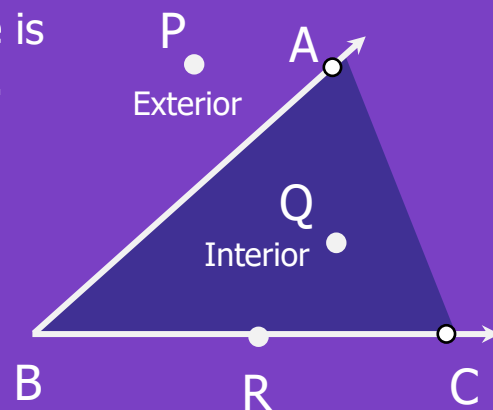
Name of the angle:
 $\angle ABC$ or $\angle CBA$

Arms of the angle: AB, BC

Vertex: B

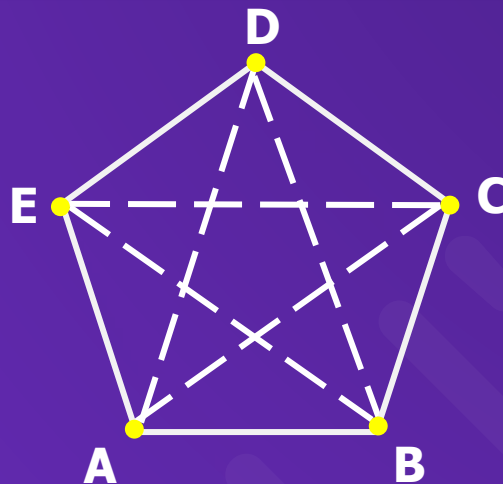
Interior and Exterior of an angle

- The shaded portion of an angle is called the **interior** of an angle. (Note that the interior is not a restricted area; it extends indefinitely). Point Q lies in the interior of $\angle ABC$.
- Region outside the angle is called as **exterior** area of an angle. Point P lies in the exterior of $\angle ABC$.
- The point **R** lies on the arm (BC) of $\angle ABC$.



6. Polygons

A polygon is a closed figure made up of straight lines.



Sides:

- The line segments forming a polygon are called its sides.
- Any two sides with a common end vertex are called the **adjacent sides** of the polygon.
- In the above polygon the sides are AB, BC, CD, DE, and AE.

Vertices

- Vertex (plural vertices) is the meeting or intersecting point of a pair of sides.
- The end points of the adjacent sides of a polygon are called the **adjacent vertices**.
- In the above polygon the vertices are A, B, C, D, and E.

Diagonals

- Diagonal is obtained by joining any two non-adjacent vertices of a polygon. The diagonals of the given polygon are AC, AD, BD, BE and CE

Mind Map

