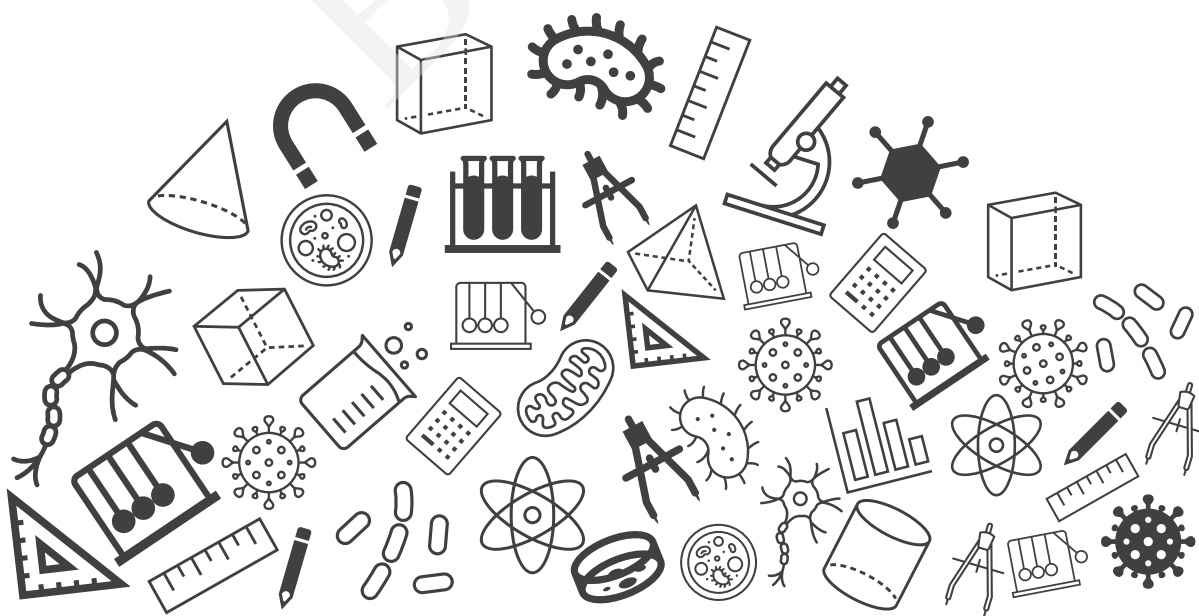




# Grade 09

## Mathematics Chapter Notes





# BYJU'S Classes

Class Notes

**LINES AND ANGLES**

Grade 09



## Topics Covered

### 1 --- Intersecting and Non-intersecting Lines

### 2 --- Angles

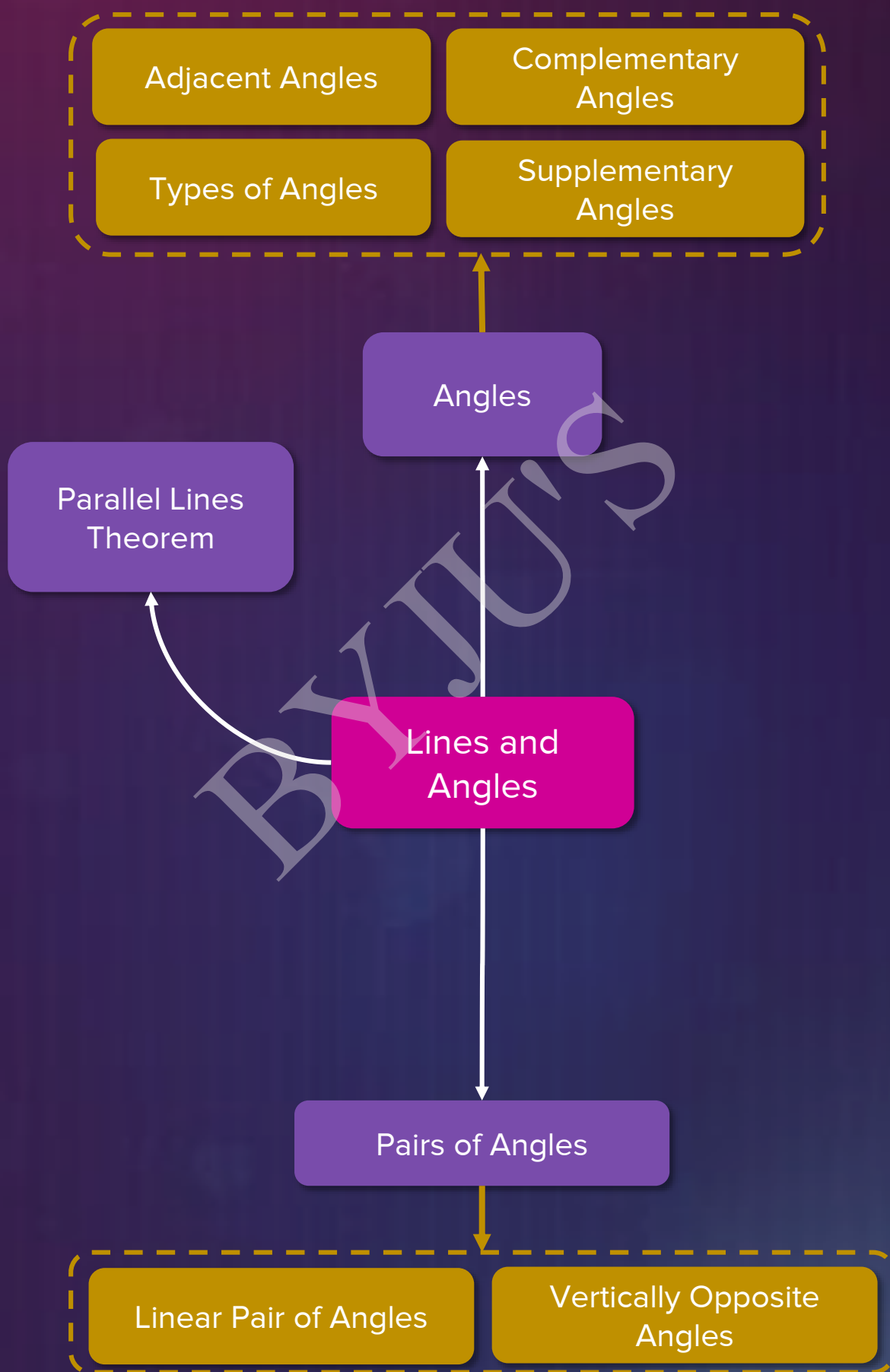
- 2.1 Types of Angles
- 2.2 Complementary Angles
- 2.3 Supplementary Angles
- 2.4 Adjacent Angles

### 3 --- Pairs of Angles

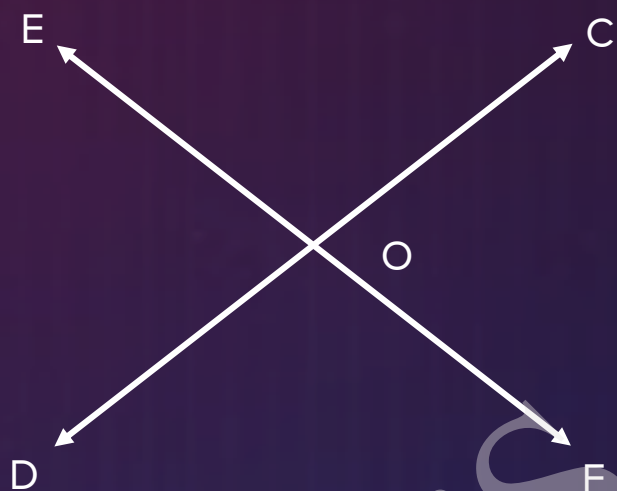
- 3.1 Linear Pair of Angles
- 3.2 Vertically Opposite Angles

### 4 --- Parallel Lines Theorem

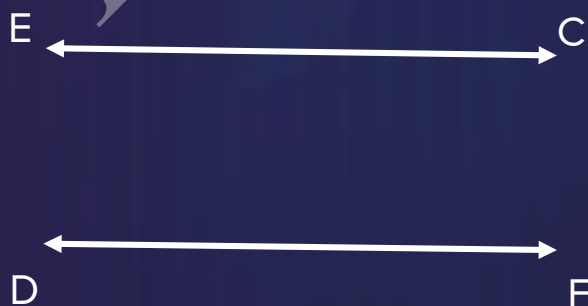
# Mind Map



# 1. Intersecting and Non-intersecting Lines



Lines EOF and COD are  
intersecting lines.



Lines EC and DF are  
non - intersecting lines  
(parallel lines).

## 2. Angles

An angle is a figure formed by two rays (arms) or lines that shares a common endpoint (vertex).

### 2.1 Types of Angles

Acute angle



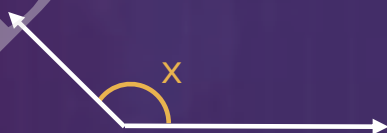
$$0^\circ < x < 90^\circ$$

Right angle



$$x = 90^\circ$$

Obtuse angle



$$90^\circ < x < 180^\circ$$

Straight angle



$$x = 180^\circ$$

Reflex angle

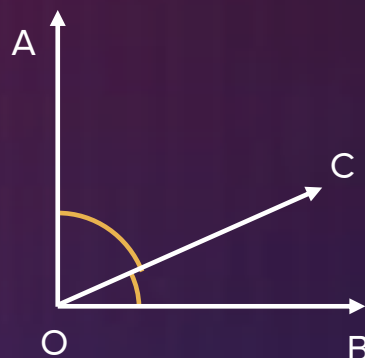


$$180^\circ < x < 360^\circ$$

## 2.2 Complementary Angles

Sum of two angles is 90 degrees.

$$\angle AOC + \angle COB = 90^\circ$$



## 2.3 Supplementary Angles

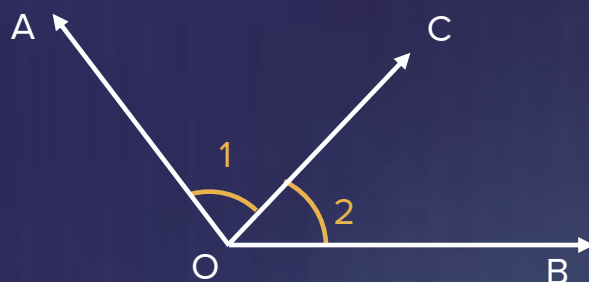
Sum of two angles is 180 degrees.

$$\angle AOC + \angle COB = 180^\circ$$



## 2.4 Adjacent Angles

Angles that have a common vertex, common arm and non-common arms are on different sides of the common arm.



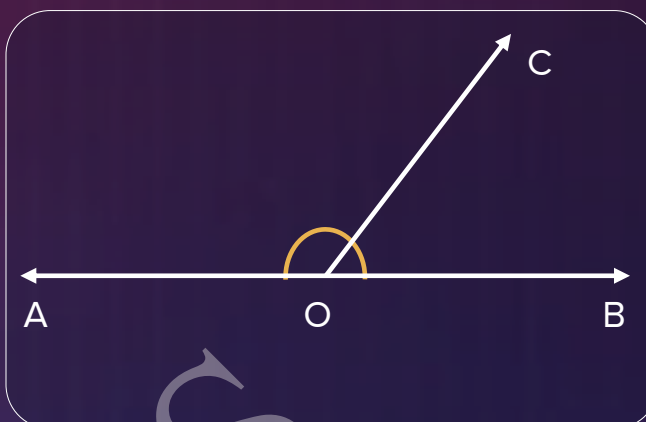
$\angle 1$  and  $\angle 2$  are adjacent angles

### 3. Pairs of Angles

#### 3.1 Linear Pair of Angles

If a ray stands on a line, then the **sum** of the **two adjacent angles** so formed is  **$180^\circ$**  and vice-versa.

This property is called as the **Linear pair axiom**.

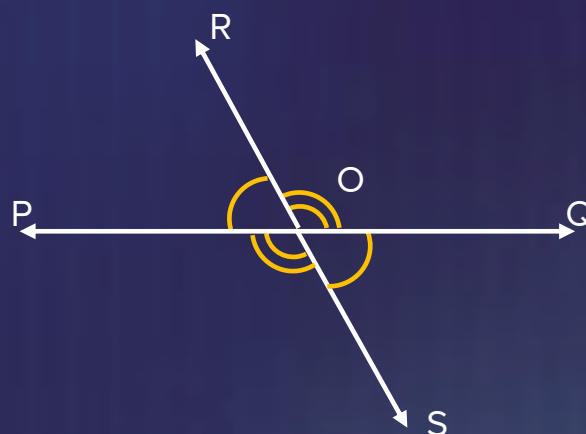


$$\angle AOC + \angle COB = 180^\circ$$

#### 3.2 Vertically Opposite Angles

If two lines intersect each other, then the **vertically opposite angles** are **equal**.

$$\begin{aligned} \angle POR &= \angle SOQ \\ \angle POS &= \angle ROQ \end{aligned}$$





## 4. Parallel Lines Theorem

Lines that are parallel to a given line are **parallel to each other**.

If

$m \parallel l$  and  $n \parallel l$

then

Line  $m$  is parallel to line  $n$ ,  
i.e.

$m \parallel n$

