



POST CLASS NOTES

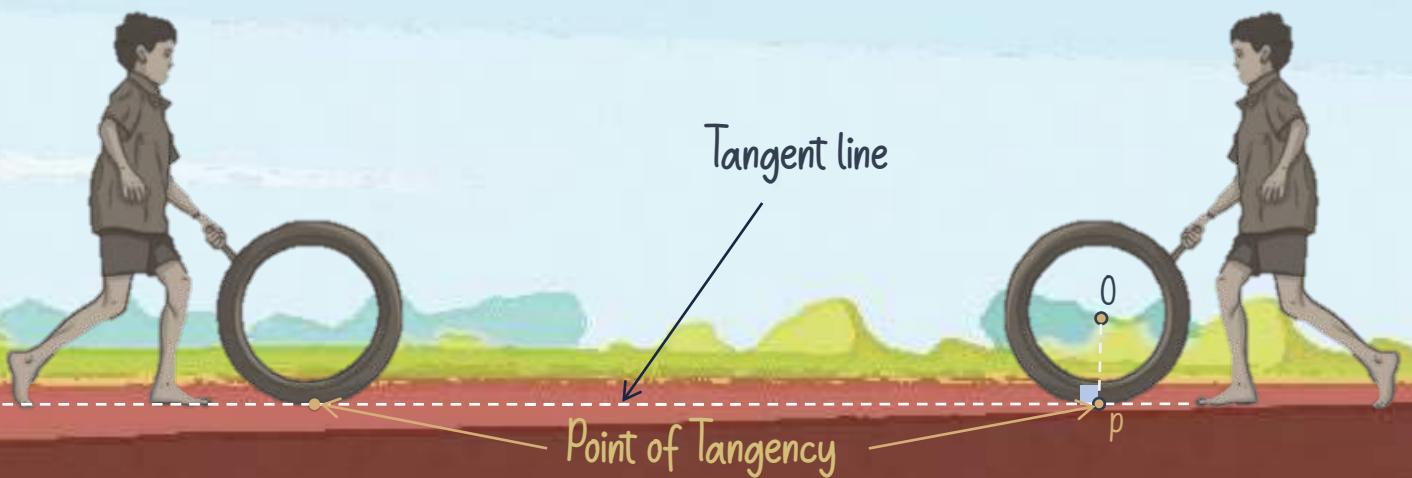
# Circles



# Topics



- 1. Lines related to a Circle
- 2. Tangents and Secants
- 3. Number of Tangents
- 4. Theorems related to a Tangent
- 5. Important Corollaries



# Circles

## Lines related to Circle

Line **outside** the circle

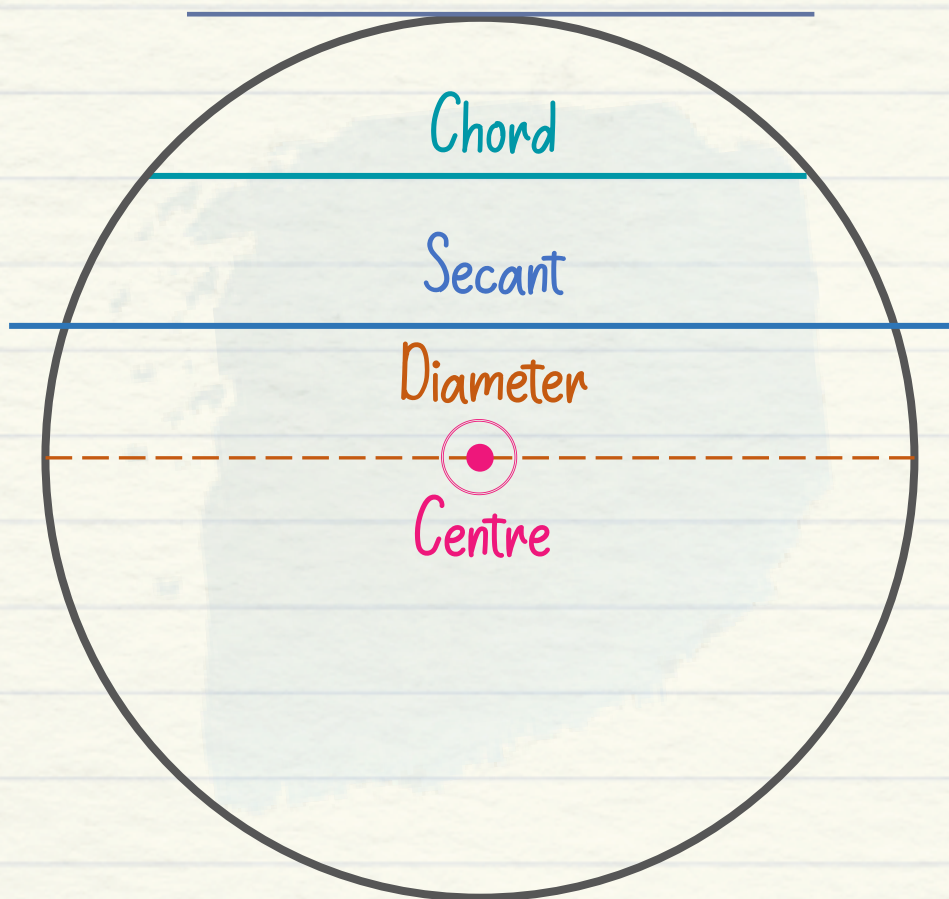
Tangent

Chord

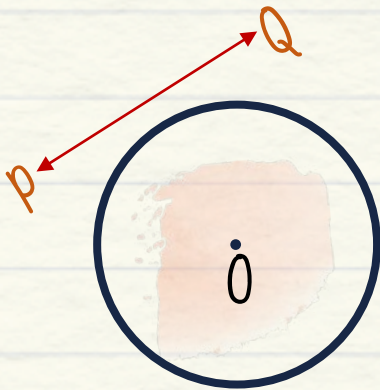
Secant

Diameter

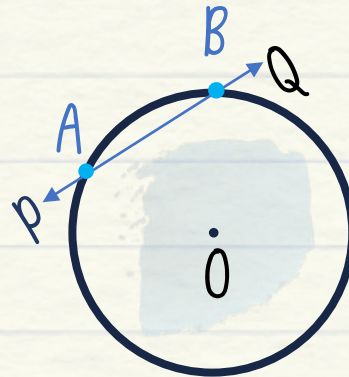
Centre



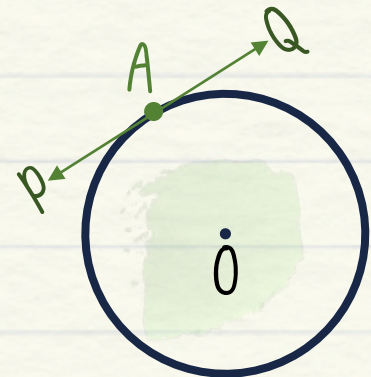
## Tangents and Secants



- ★ Does **not** touch the circle
- ★ **No** point of intersection

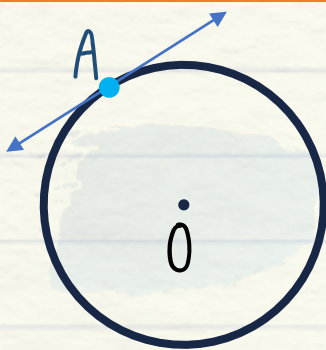


- ★ **2** points of intersection
- ★ PQ is the **secant**

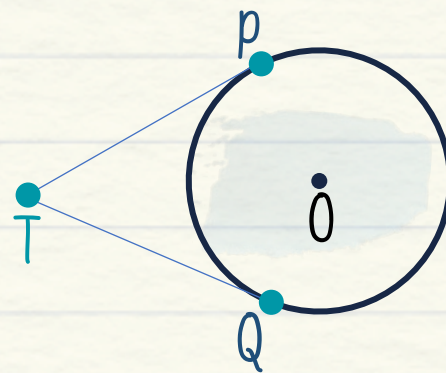


- ★ Touches only at **1** point
- ★ PQ is called **tangent**

## No. of Tangents



For any point **on the circumference** of a circle,  
No. of tangents = **1**



No. of tangents from an external point to circle = **2**

# Theorems related to Tangent

## Theorem 1

### Tangents and Radius

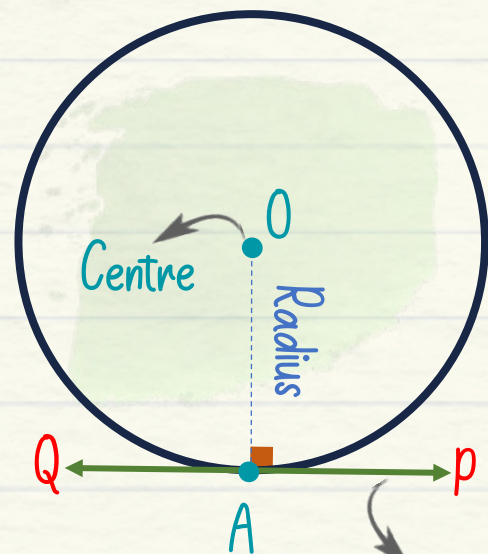
## Theorem 2

### Tangents from external point

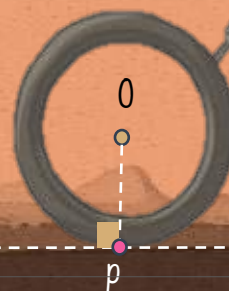
#### 1: Tangents and Radius

**Theorem :-** The tangent at any point of the circle is perpendicular to the radius through the point of contact.

Hence,  $PQ \perp OA$



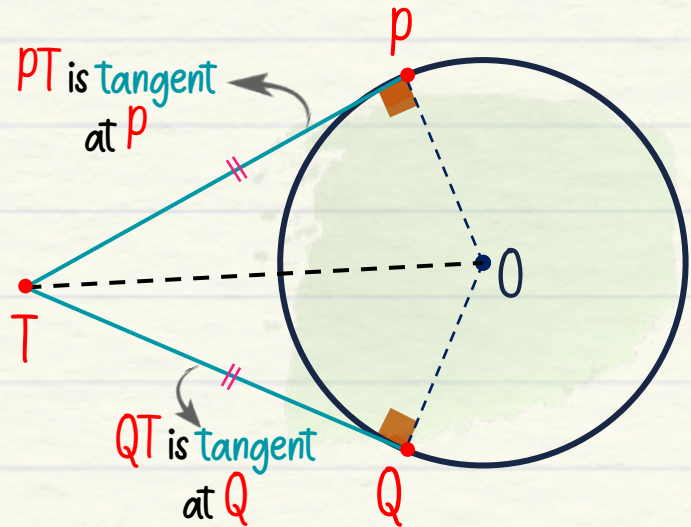
Tangent line



## 2: Tangents from external point

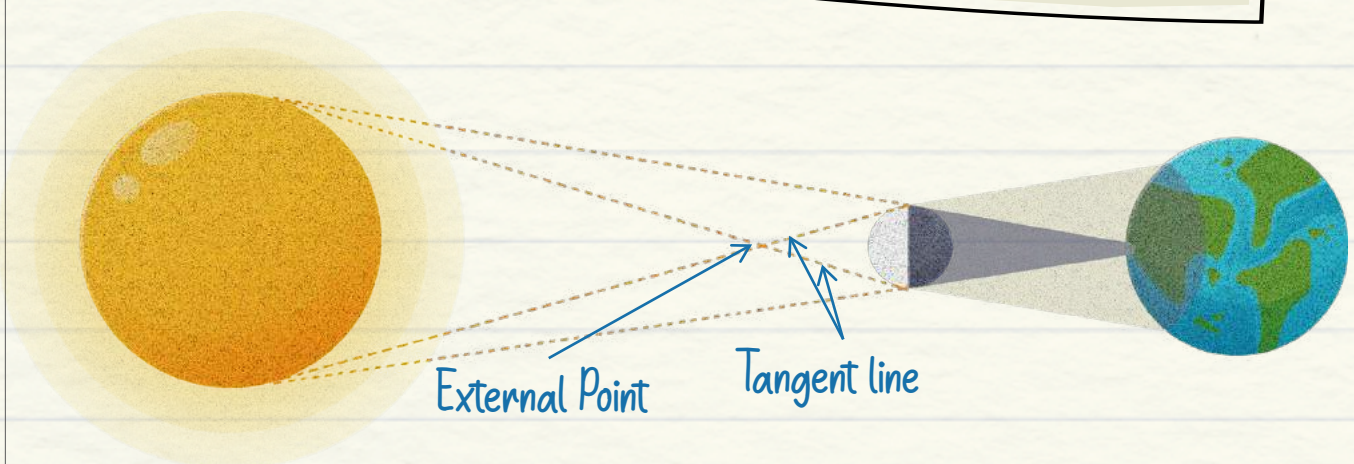
**Theorem :-** The lengths of **tangents** drawn from an external **point** to a circle are **equal**.

Hence,  $PT = QT$

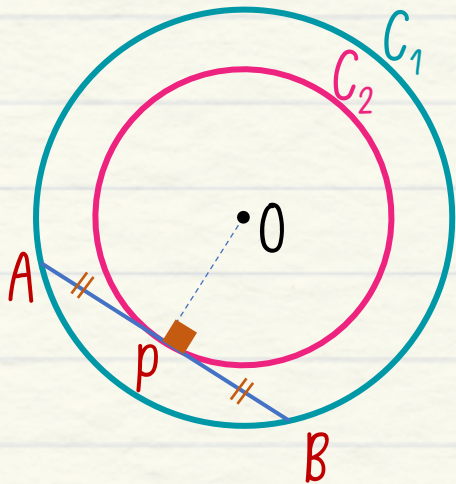


Can be proved in two ways :-

- ★ Congruence of  $\triangle TOP$  &  $\triangle TOQ$
- ★ "Pythagoras" theorem

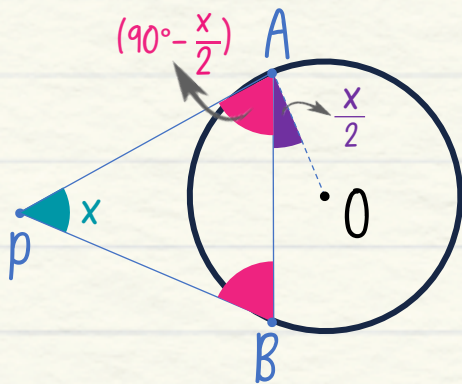


## Important Corollaries



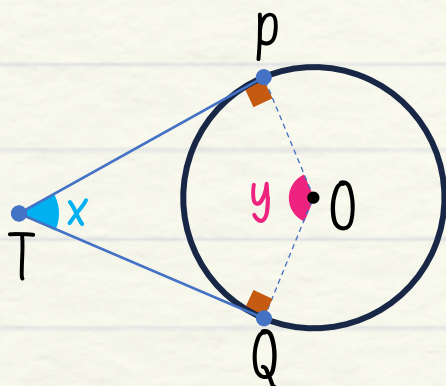
For  $C_1$  and  $C_2$  being concentric circles,

- ★  $OP$  is perpendicular bisector of  $AB$
- ★  $AP = PB$



$PA$  and  $PB$  are 2 tangents drawn from an external point  $P$  to a circle with centre at  $O$ ,

- ★  $\angle APB = 2\angle BAO$
- ★  $\angle PAB = \angle PBA = (90^\circ - \frac{x}{2})$



- ★  $x$  and  $y$  are supplementary  
i.e.  $x + y = 180^\circ$



## Mind Map

