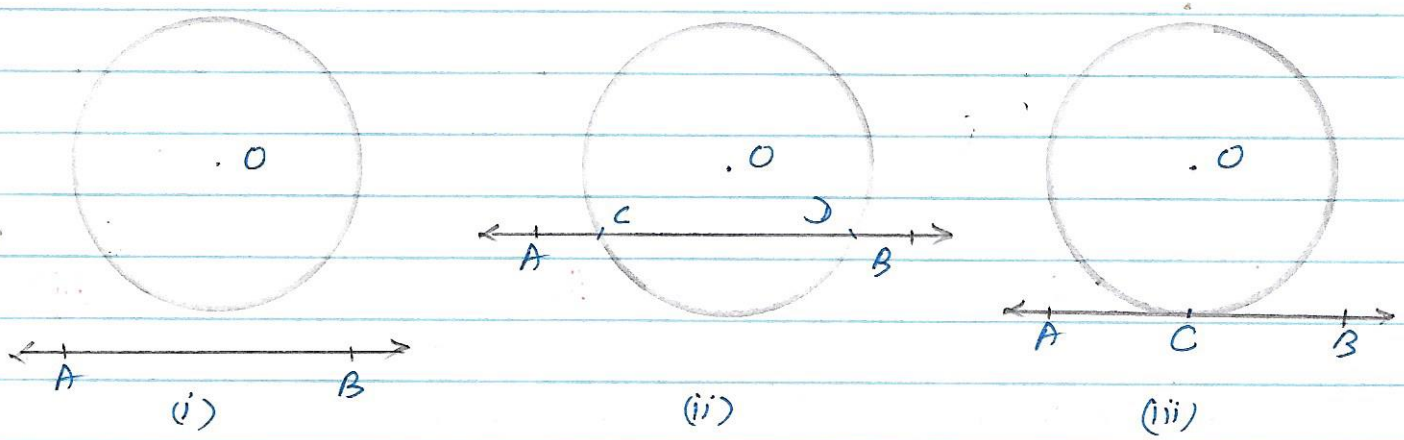
Mathematics - Class X
Chapter 10 - Circles

Introduction



(i) Line AB does not intersect circle and it is outside the circle. AB is called a non-intersecting line with respect to the circle.

(ii) The line AB intersects the circle in two distinct points C and D. The line AB is called a secant of circle.

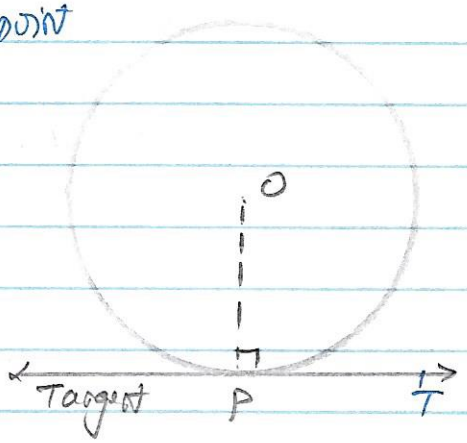
(iii) Line AB touch the circle at point C. The point C is called the point of contact of line AB with the circle. A line meeting a circle only in one point is called a tangent to the circle.

Tangent to a Circle

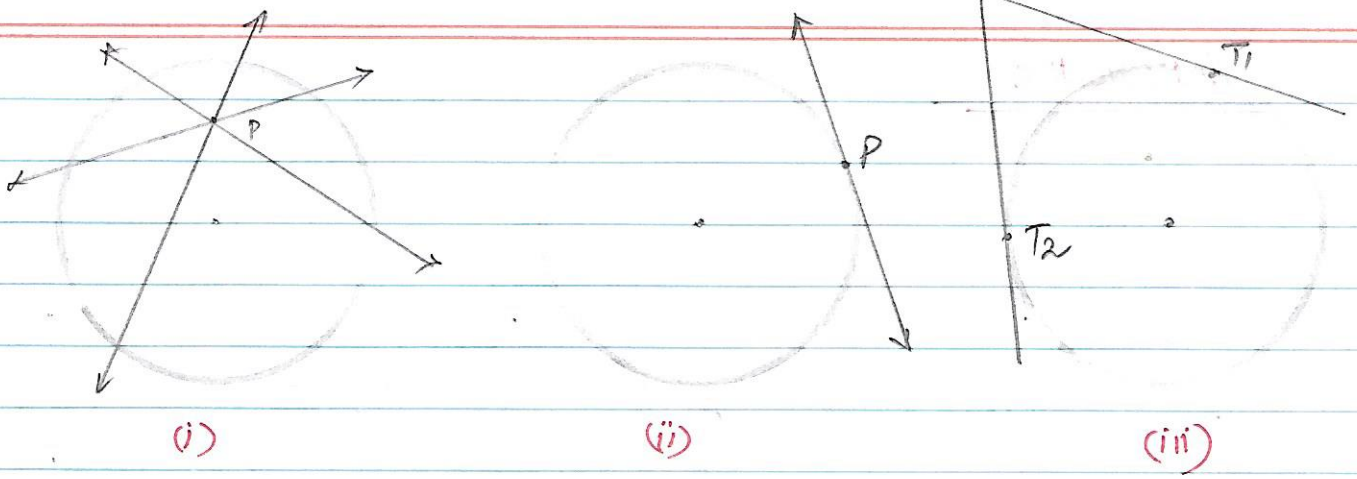
The tangent to a circle is a special case of the secant, when the two end points of its corresponding chord coincide.

Theorem 10.1 : The tangent at any point of a circle is perpendicular to the radius through the point of contact.

Tangent ⊥ Radius, OP ⊥ PT.



(1)



(i) (ii) (iii)

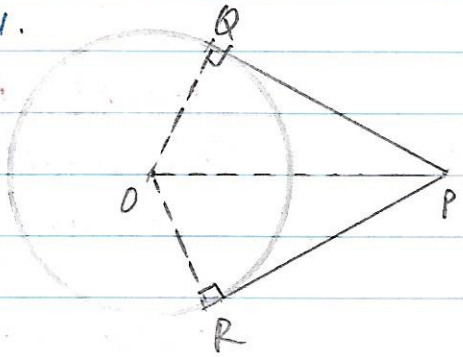
(i) There is no tangent to a circle passing through a point lying inside the circle.

(ii) There is one and only one tangent to a circle passing through a point lying on the circle.

(iii) There are exactly two tangents to a circle through a point lying on the circle.

The length of the segment of the tangent from the external point P and the point of contact with the circle is called the length of the tangent from the point P to the circle.

Theorem 10.2 : The length of tangents drawn from an external point to a circle are equal.



In $\triangle POQ$ & $\triangle POR$

$OQ = OR$ (Radii)

$\angle OQP = \angle ORP = 90°$

$OP = OP$ (Common)

$\therefore \triangle POQ \cong \triangle POR$ (RHS Rule)

$\therefore PQ = PR$ (CPCT)