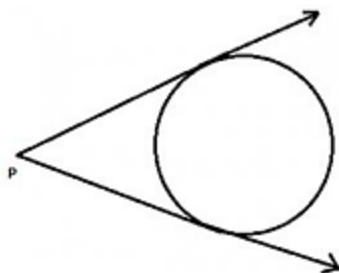


Board –CBSE

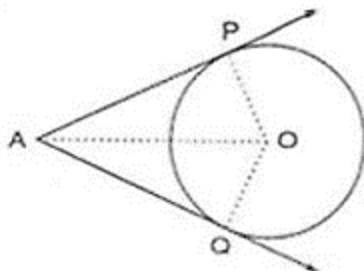
Class –10th

Topic – Circle

- Prove that from a point, lying outside a circle, two and only two tangents can be drawn to it. When the point lies outside the circle, there are exactly two tangents to circle from a point that lies outside the circle. As shown in the figure.



- Prove that the lengths of the two tangents drawn from an external point to a circle are equal.



Given:  $AP$  and  $AQ$  are two tangents from a point  $A$  to a circle  $C(O, r)$ .

To Prove:  $AP = AQ$

Construction: Join  $OP$ ,  $OQ$ , and  $OA$

Proof: In order to prove that  $AP = AQ$  we shall first prove that  $\triangle OPA \cong \triangle OQA$ .

Since a tangent at any point of a circle is perpendicular to the radius through the point of contact,

$$OP \perp AP \text{ and } OQ \perp AQ \Rightarrow \angle OPA = \angle OQA = 90^\circ \dots\dots (i)$$

Now, in the right triangle  $OPA$  and  $OQA$ , we have

$$OP = OQ$$

[Radii of a circle]

$\angle OPA = \angle OQA$  [ From (i) ]

And,  $OA = OA$  [Common]

$\triangle OPA \cong \triangle OQA$  (by RHS-Criterion)

$\Rightarrow AP = AQ$