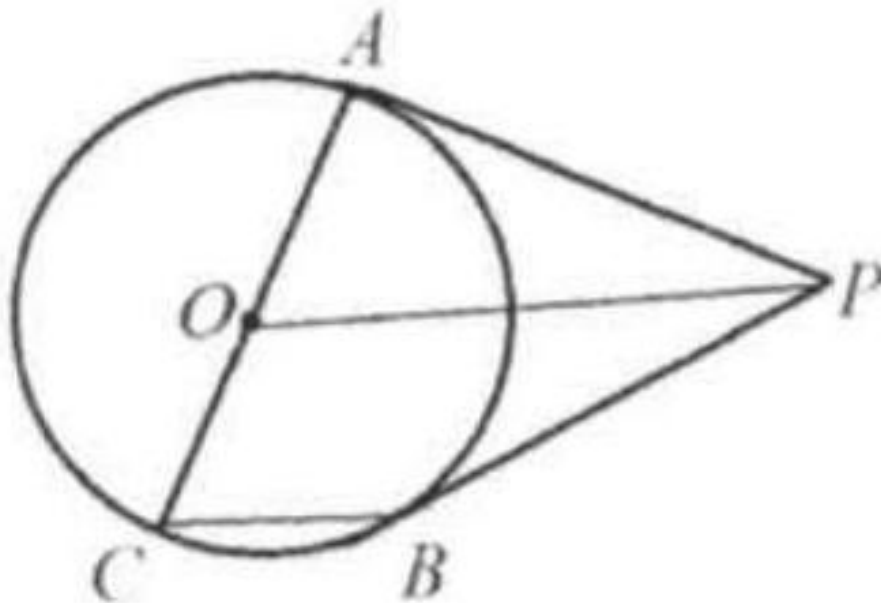


Problem

PA and PB are tangent to circle O at A and B , respectively. AC is the diameter of circle O . Prove: $BC \parallel PO$.



Solution

Method 1:

Connect AB . Extend PB to E .

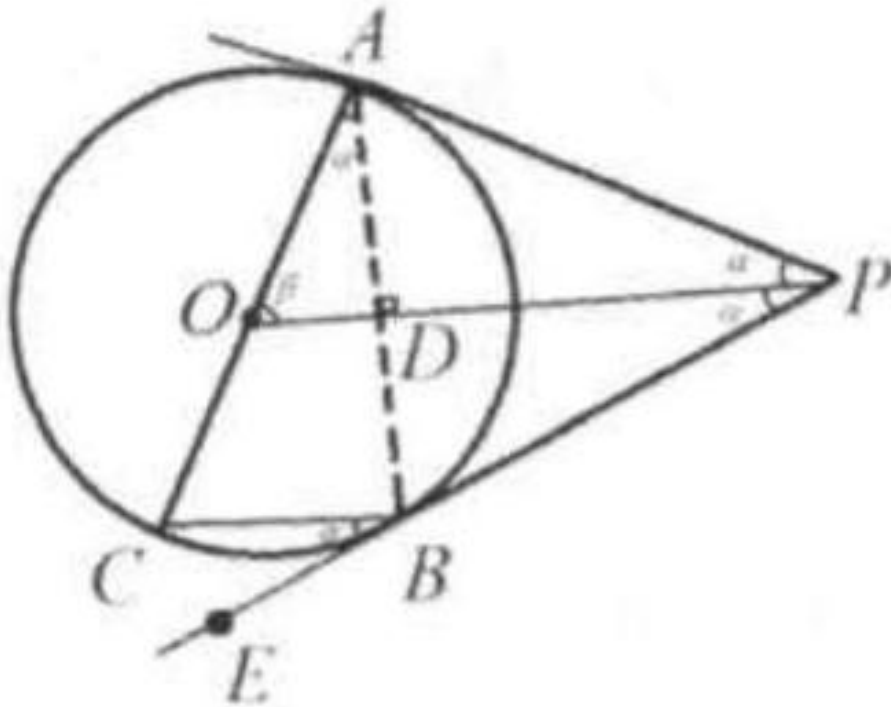
Since PA and PB are tangent to circle O , $\angle APD = \angle BPD = \alpha$, $\angle PAO = 90^\circ$, $\angle PDA = 90^\circ$,

Let $\angle POA = \beta$.

$$\angle DAO + \angle DOA = \angle DAO + \beta = 90^\circ.$$

$$\angle APO + \angle DOA = \alpha + \beta = 90^\circ.$$

So $\angle DAO = \alpha$.



$\angle CAB = \angle CBE$ (both face the same arc BC).

So $\angle CBE = \alpha$.

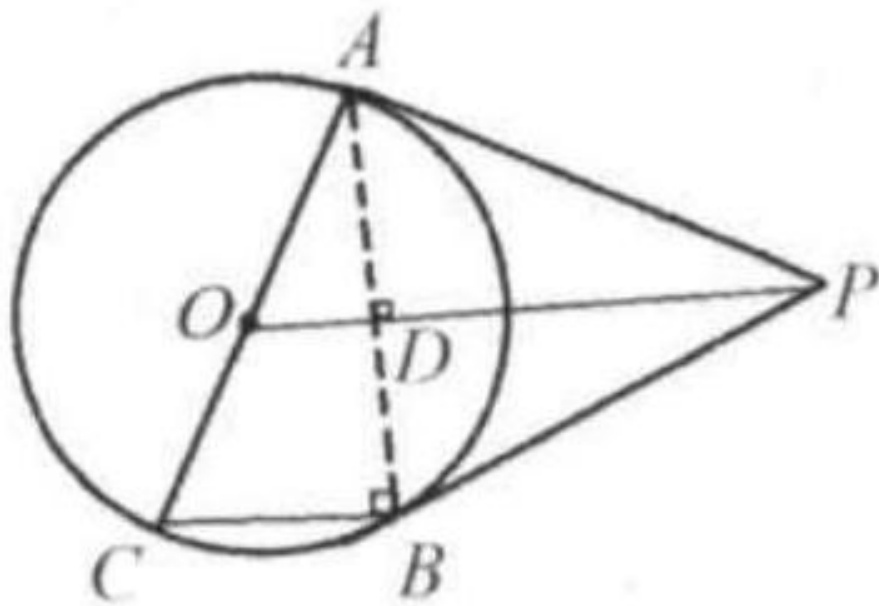
Thus $BC \parallel PO$.

Method 2:

Connect AB .

Since PA and PB are tangent to circle O , $\angle ADP = \angle BDP = 90^\circ$, $PD \perp AB$
or $PO \perp AB$

Since AC is the diameter,



$\angle ABC = 90^\circ. BC \perp AB.$
 Thus $BC \parallel PO.$