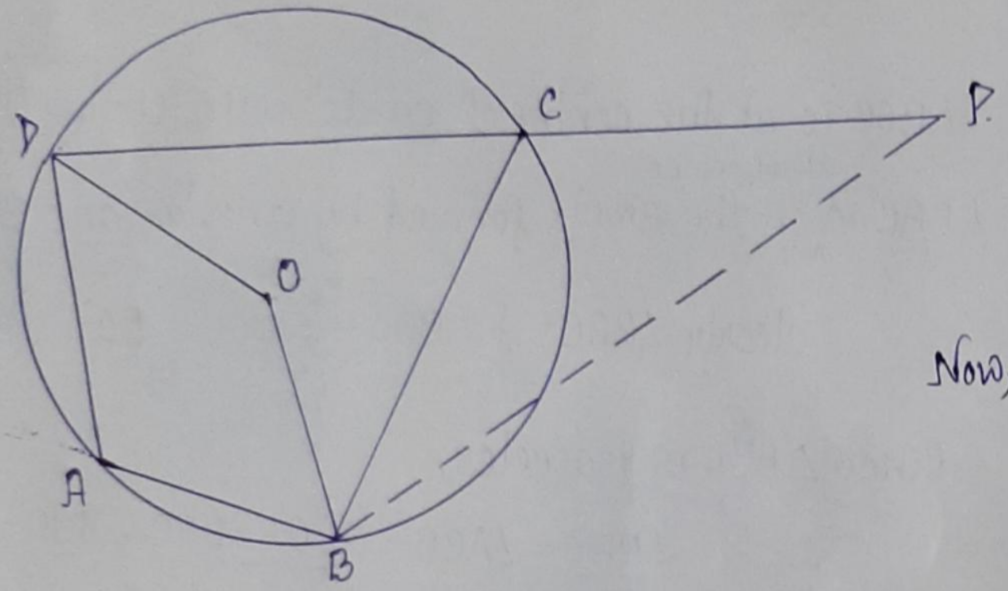
ABCD is a cyclic quadrilateral of a circle with centre O. DC is extended to the point P. If $\angle BCP = 108°$, calculate the value of $\angle BOD$.



joining B, P

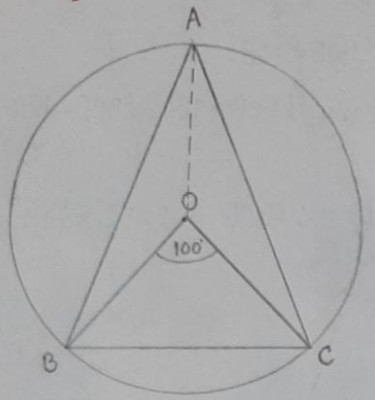
$\angle BCP = 108°$

clearly, $\angle BCD = 180° - \angle BCP = 180° - 108°$

$= 72°$

Now, $\angle BOD = 2\angle BCD = 2 \times 72° = 144°$.

O is the circumcentre of the isosceles triangle ABC, whose AB = AC, the point A and BC are on opposite sides of centre O. If $\angle BOC = 100°$. Write by calculating, the values of $\angle ABC$ and $\angle ABO$.



$\angle BOC$ is at the centre of circle with centre O and $\angle BAC$ is at any point on the circle formed by circular arc BDC.

clearly $\angle BAC = \frac{1}{2}\angle BOC = \frac{1}{2} \times 100° = 50°$

Since $\triangle ABC$ is isosceles,

$\angle ABC = \angle ACB = \frac{180° - \angle BAC}{2} = \frac{180° - 50°}{2}$
$= 65°$

To prove, $\triangle AOB \cong \triangle AOC$, joining A, O

In $\triangle AOB$, $\triangle AOC$,

AB = AC (given)

AO is common

OB = OC (radii of same circle)

$\triangle AOB \cong \triangle AOC$ (By S.S.S)

$\therefore \angle OAB = \angle OAC = \frac{\angle BAC}{2} = \frac{50°}{2} = 25°$ (corresponding angle)

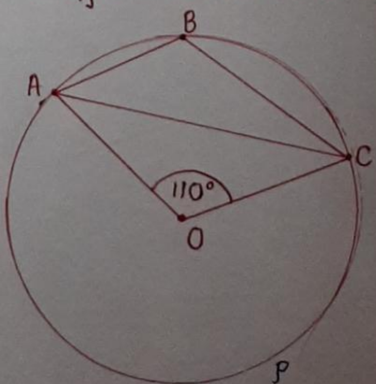
In $\triangle AOB$,

OA = OB (radii of same circle)

$\angle OBA = \angle OAB = 25°$

ie $\angle ABO = 25°$

In the adjoining figure, if O is the centre of circumcircle of $\triangle ABC$ and $\angle AOC = 110°$ Calculate value of $\angle ABC$.



Reflex $\angle AOC = 360° - 110° = 250°$ is at the centre O of the circle and $\angle ABC$ is at B point of the circle formed by same arc APC.

$\angle ABC = \frac{1}{2}$ reflex $\angle AOC = \frac{1}{2} \times 250° = 125°$.