Exercise 11B

Question 1:

(i) Join BO.

In ΔBOC we have

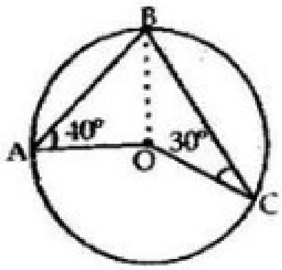
$OC = OB$ $\quad$ [Each equal to the radius]

$\Rightarrow \angle OBC = \angle OCB$ $\quad$ [$\because$ base angles of an isosceles triangle are equal]

$\Rightarrow \angle OBC = 30^\circ$ $\quad$ [$\because \angle OCB = 30^\circ$]

Thus, we have,

$\angle OBC = 30^\circ$ $\quad$ ......(1)



Now, in ΔBOA, we have

$$OB = OC \qquad \text{[Each equal to the radius]}$$

$$\Rightarrow \quad \angle OAB = \angle OBA \qquad \left[\begin{array}{l}\because \text{base angles of an isosceles} \\ \text{triangle are equal}\end{array}\right]$$

$$\Rightarrow \quad \angle OBA = 40^\circ \qquad [\because \angle OAB = 40^\circ, \text{given}]$$

Thus, we have,

$$\angle OBA = 40^\circ \qquad .....(2)$$

$$\therefore \quad \angle ABC = \angle OBC + \angle OBA$$

$$\Rightarrow \quad = 30^\circ + 40^\circ \qquad [\text{from (1) and (2)}]$$

$$\Rightarrow \quad \angle ABC = 70^\circ$$

The angle subtended by an arc of a circle at the centre is double the angle subtended by the arc at any point on the circumference.

$$\therefore \quad \angle AOC = 2 \times \angle ABC$$

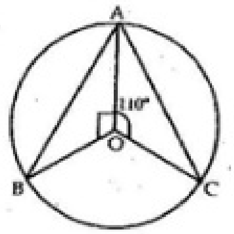
$$= 2 \times 70^\circ = 140^\circ$$

(ii) $$\angle BOC = 360^\circ - (\angle AOB + \angle AOC)$$

$$= 360^\circ - (90^\circ + 110^\circ)$$

$$= 360^\circ - 200^\circ = 160^\circ$$

We know that $\angle BOC = 2\angle BAC$



$$\Rightarrow \quad \angle BAC = \frac{160^\circ}{2} = 80^\circ \qquad [\because \angle BOC = 160^\circ]$$

$$\therefore \quad \angle BAC = 80^\circ.$$

*********** END **********