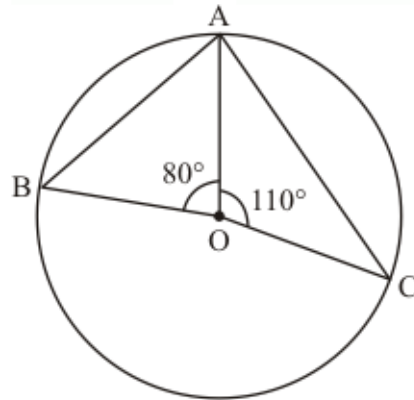Circles Ex 16.4 Q3

Answer :

It is given that

$\angle BOA = 80^0$ And $\angle AOC = 110^0$ (given)

We have to find $\angle BAC$

In given triangle ΔBOA

$\angle BOA = 80^0$ (Given)

$OB = OA$ (Radii of the same circle)

Therefore, ΔBOA is an isosceles triangle.

So, $\angle OBA = \angle OAB$ ..... (1)

$\angle AOB + \angle OBA + \angle BAO = 180^0$

$80^0 + \angle OBA + \angle BAO = 180^0$ (Given $\angle BOA = 80^0$)

$80^0 + 2(\angle BAO) = 180^0$ [From (1)]

So

$$2(\angle BAO) = 180^0 - 80^0$$
$$= 100^0$$

Again from figure, $\triangle AOC$ is given triangle and $\angle COA = 110^0$

Now in $\triangle AOC$,

$$OA = OC \qquad \text{(Radii of the same circle)}$$

$$\angle OAC = \angle OCA$$
$$\angle AOC + \angle OCA + \angle OAC = 180^0$$
$$110^0 + \angle OCA + \angle OAC = 180^0 \qquad \text{(Given that } \angle AOC = 80^0\text{)}$$
$$110^0 + 2(\angle OAC) = 180^0$$
$$= 2(\angle OAC)$$
$$= 180^0 - 110^0$$
$$= 70^0$$

Then,

$$\angle OAC = \frac{70^0}{2}$$
$$= 35^0$$

Since

$$\angle BAC = \angle BAO + \angle OAC$$
$$= 50^0 + 35^0$$
$$= 85^0$$

Hence $\boxed{\angle BAC = 85^0}$

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