Exercise 11B

Question 12:

$OB = OC$ [Radius]

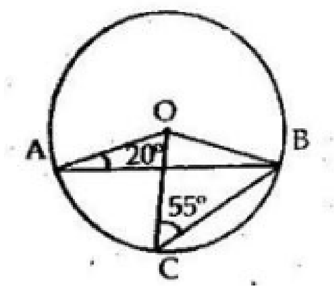
$\Rightarrow \angle OBC = \angle OCB = 55^\circ$ [base angles in an isosceles triangle are equal]

Consider the triangle ΔBOC.

By angle sum property, we have

$$\angle BOC = 180^\circ - (\angle OCB + \angle OBC)$$
$$= 180^\circ - (55^\circ + 55^\circ)$$
$$= 180^\circ - 110^\circ = 70^\circ$$

$\therefore \angle BOC = 70^\circ$



Again, $OA = OB$

$\Rightarrow \angle OBA = \angle OAB = 20^\circ$ [base angles in an isosceles triangle are equal]

Consider the triangle ΔAOB.

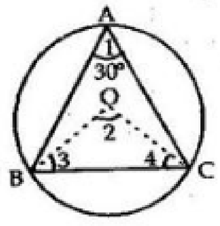
By angle sum property, we have

$$\Rightarrow \angle AOB = 180^\circ - (\angle OAB + \angle OBA)$$
$$= 180^\circ - (20^\circ + 20^\circ)$$
$$= 180^\circ - 40^\circ = 140^\circ$$

$$\therefore \angle AOC = \angle AOB - \angle BOC$$
$$= 140^\circ - 70^\circ = 70^\circ$$

$\therefore \angle AOC = 70^\circ$

Question 13:



Join OB and OC.

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.

$\therefore \quad \angle BOC = 2\angle BAC$

$= 2 \times 30^\circ \qquad [\because \angle BAC = 30^\circ]$

$= 60^\circ \qquad ....(1)$

Now consider the triangle ΔBOC.

$OB = OC \qquad$ [radii]

$\Rightarrow \quad \angle OBC = \angle OCB \qquad ....(2)$

[base angles in an isosceles triangle are equal]

Now, in ΔBOC, we have

$\angle BOC + \angle OBC + \angle OCB = 180^\circ$

$\Rightarrow \quad 60^\circ + \angle OCB + \angle OCB = 180^\circ \qquad$ [from (1) and (2)]

$\Rightarrow \quad 2\angle OCB = 180^\circ - 60^\circ$

$\Rightarrow \quad = 120^\circ$

$\Rightarrow \quad \angle OCB = \frac{120^\circ}{2} = 60^\circ$

$\Rightarrow \quad \angle OBC = 60^\circ \qquad$ [from (2)]

Thus, we have, $\angle OBC = \angle OCB = \angle BOC = 60^\circ$

So, ΔBOC is an equilateral triangle

$\Rightarrow \quad OB = OC = BC$

$\therefore$ BC is the radius of the circumference.

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