Activity 22

Objective

To verify that the angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

Material Required

Cardboard, coloured drawing sheets, scissors, sketch pens, adhesive, geometry box, transparent sheet.

Method of Construction

1. Take a rectangular cardboard of a convenient size and paste a white paper on it.
2. Cut out a circle of suitable radius on a coloured drawing sheet and paste on the cardboard.
3. Take two points B and C on the circle to obtain the arc BC [see Fig. 1].
4. Join the points B and C to the centre O to obtain an angle subtended by the arc BC at the centre O.
5. Take any point A on the remaining part of the circle. Join it to B and C to get $\angle BAC$ subtended by the arc BC on any point A on the remaining part of the circle [see Fig. 1].
6. Make a cut-out of $\angle BOC$ and two cut-outs of angle BAC, using transparent sheet [see Fig. 2].

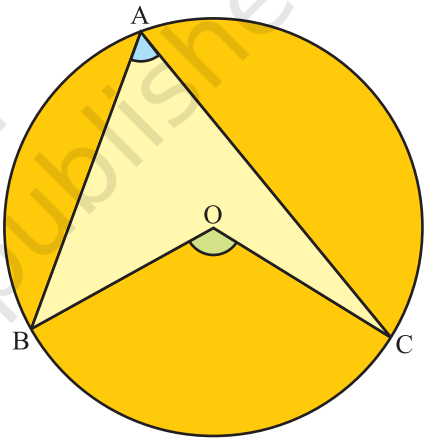

Fig. 1

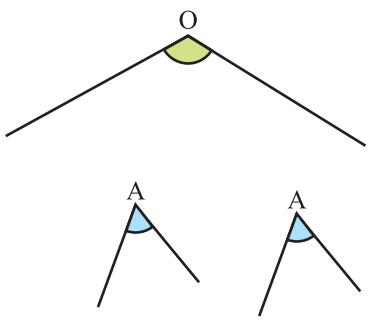

Fig. 2

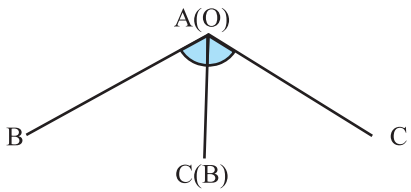

Fig. 3

Demonstration

Place the two cut-outs of ∠BAC on the cut-out of angle BOC, adjacent to each as shown in the Fig. 3. Clearly, 2 ∠BAC = ∠BOC, i.e., the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

Observation

Measure of ∠BOC = ...

Measure of ∠BAC = ...

Therefore, ∠BOC = 2 .....

Application

This property is used in proving many other important results such as angles in the same segment of a circle are equal, opposite angles of a cyclic quadrilateral are supplementary, etc.