

## CHAPTER-10

### 1 EXERCISE - 10.3

1. If arcs  $AXB$  and  $CYD$  of a circle are congruent, find the ratio of  $AB$  and  $CD$ .
2. If the perpendicular bisector of a chord  $AB$  of a circle  $PXAQBY$  intersects the circle at  $P$  and  $Q$ , prove that  $\text{arc } PXA \cong \text{Arc } PYB$ .
3.  $A, B$  and  $C$  are three points on a circle. Prove that the perpendicular bisectors of  $AB, BC$  and  $CA$  are concurrent.
4.  $AB$  and  $AC$  are two equal chords of a circle. Prove that the bisector of the angle  $BAC$  passes through the centre of the circle.
5. If a line segment joining mid-points of two chords of a circle passes through the centre of the circle, prove that the two chords are parallel.
6.  $ABCD$  is such a quadrilateral that  $A$  is the centre of the circle passing through  $B, C$  and  $D$ . Prove that  $\angle CBD + \angle CDB = \frac{1}{2}\angle BAD$
7.  $O$  is the circumcentre of the triangle  $ABC$  and  $D$  is the mid-point of the base  $BC$ . Prove that  $\angle BOD = \angle A$ .
8. On a common hypotenuse  $AB$ , two right triangles  $ACB$  and  $ADB$  are situated on opposite sides. Prove that  $\angle BAC = \angle BDC$ .
9. Two chords  $AB$  and  $AC$  of a circle subtends angles equal to  $90^\circ$  and  $150^\circ$ , respectively at the centre. Find  $\angle BAC$ , if  $AB$  and  $AC$  lie on the opposite sides of the centre.
10. If  $BM$  and  $CN$  are the perpendiculars drawn on the sides  $AC$  and  $AB$  of the triangle  $ABC$ , prove that the points  $B, C, M$  and  $N$  are concyclic.
11. If a line is drawn parallel to the base of an isosceles triangle to intersect its equal sides, prove that the quadrilateral so formed is cyclic.
12. If a pair of opposite sides of a cyclic quadrilateral are equal, prove that its diagonals are also equal.
13. The circumcentre of the triangle  $ABC$  is  $O$ . Prove that  $\angle OBC + \angle BAC = 90^\circ$ .

14. A chord of a circle is equal to its radius. Find the angle subtended by this chord at a point in major segment.
15. In Fig1  $\angle ADC = 130^\circ$  and chord  $BC =$  chord  $BE$ . Find  $\angle CBE$ .

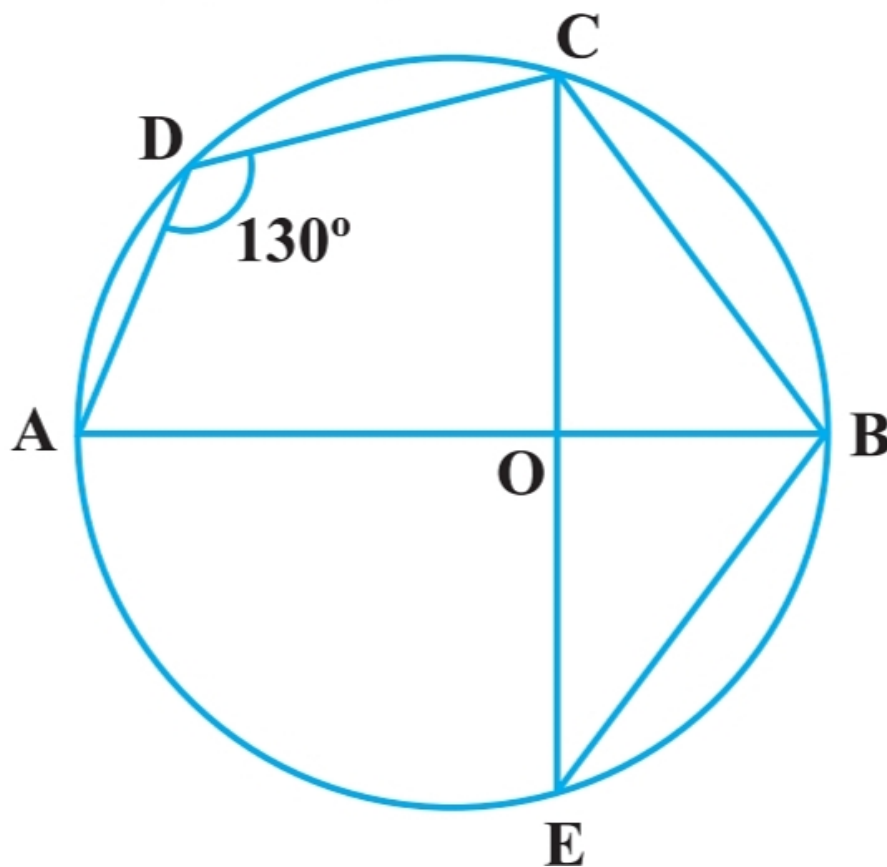


Figure 1

16. In Fig2  $\angle ACB = 40^\circ$ . Find  $\angle OAB$ .
17. A quadrilateral  $ABCD$  is inscribed in a circle such that  $AB$  is a diameter and  $\angle ABC = 130^\circ$ . Find  $\angle BAC$ .
18. Two circles with centres  $O$  and  $O'$  intersect at two points  $A$  and  $B$ . A line  $PQ$  is drawn parallel to  $OO'$  through  $A$ (or  $B$ ) intersecting the circles at  $P$  and  $Q$ . Prove that  $PQ = 2 OO'$ .

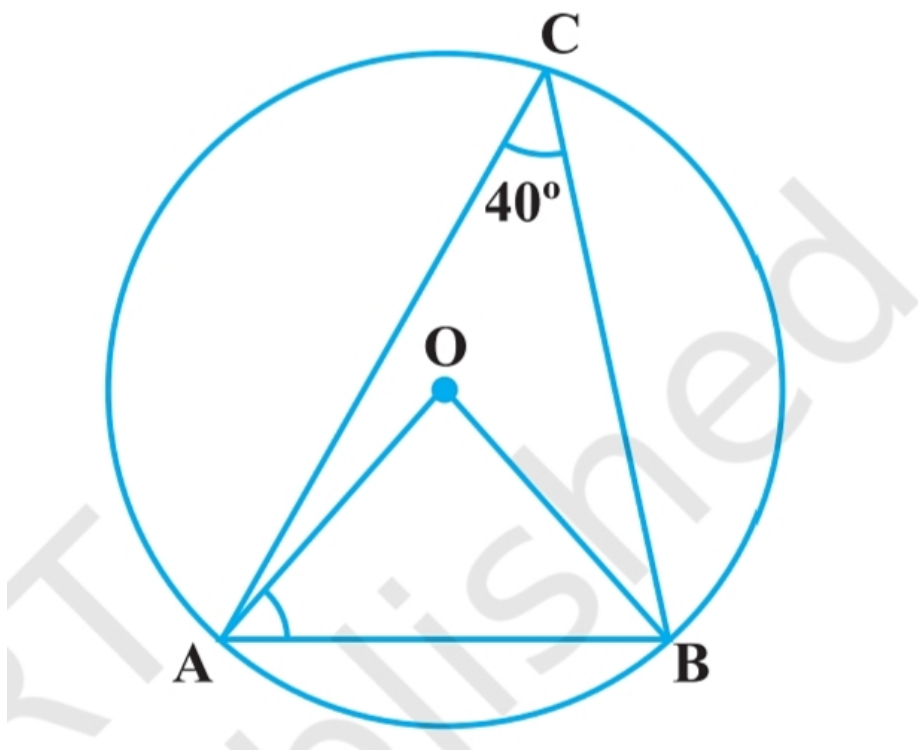


Figure 2

19. In Fig3  $AOB$  is a diameter of the circle and  $C, D, E$  are any three points of the semi-circle. Find the value of  $\angle ACD + \angle BED$ .
20. In Fig4  $\angle OAB = 30^\circ$  and  $\angle OCB = 57^\circ$ . Find  $\angle BOC$  and  $\angle AOC$ .

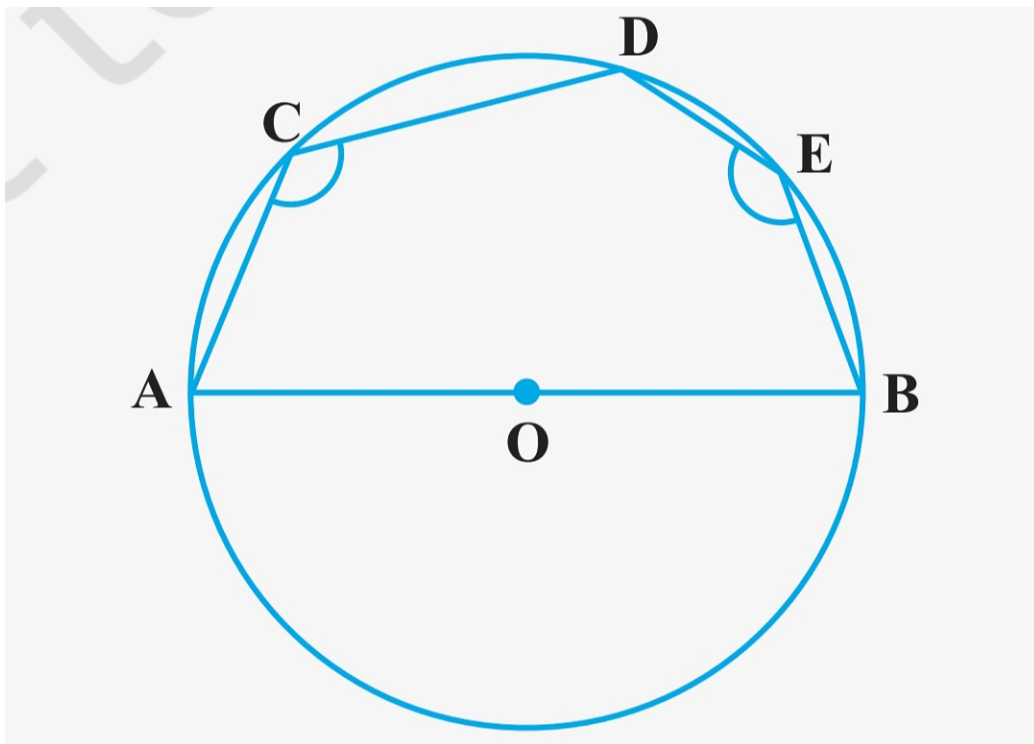


Figure 3

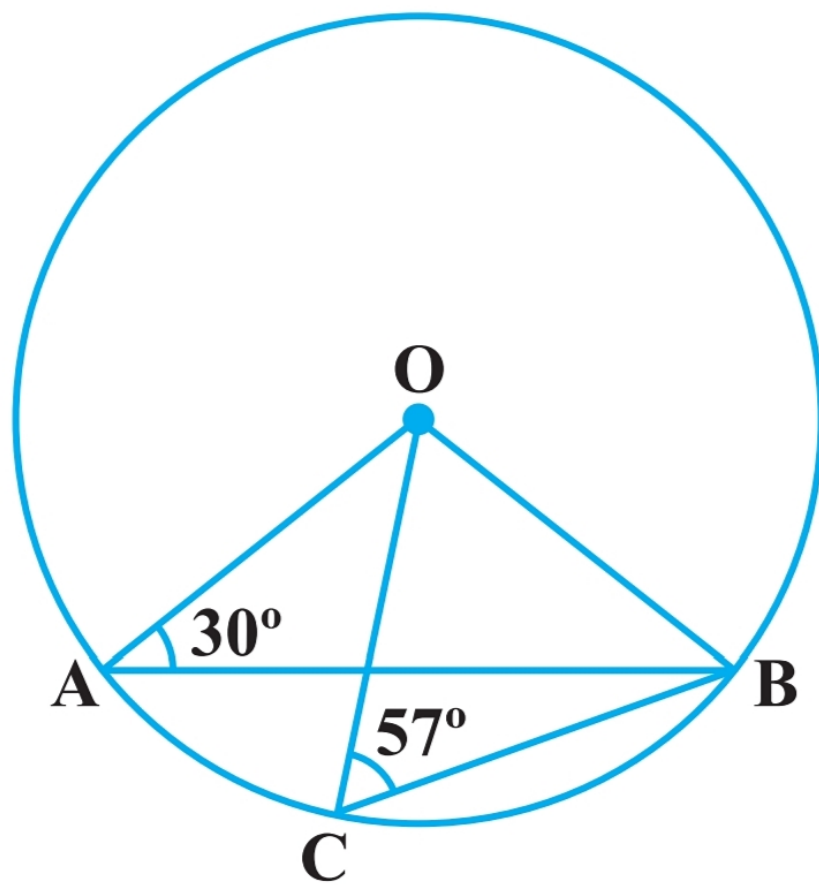


Figure 4