CIRCLES

1. The centre of a circle lies in _____ of the circle.
(a)exterior (b) interior (c) boundary (d) none of these

2. A point, whose distance from the centre of a circle is greater than its radius lies in of the circle.
(a)exterior (b) interior (c) boundary (d) none of these

3. The longest chord of a circle is a _____ of the circle.
(a) diameter (b) semicircle (c) chord (d) sector

4. Segment of a circle is the region between an arc and _____ of the circle.
(a) diameter (b) semicircle (c) chord (d) sector

5. A circle divides the plane, on which it lies, in parts.
(a) two (b) three (c) four (d) five

6. *Equal chords of a circle subtend _____angles at the centre.*
(a) half (b) one third (c) one fourth (d) equal

7. *If the angles subtended by the chords of a circle at the centre are equal, then the chords are _____.*
(a) half (b) one third (c) one fourth (d) equal

8. *The perpendicular from the centre of a circle to a chord _____ the chord.*
(a) trisect (b) bisect (c) coincide (d) none of these.

9. *The line drawn through the centre of a circle to _____ a chord is perpendicular to the chord.*
(a) trisect (b) bisect (c) coincide (d) none of these.

10. *There is one and only one circle passing through _____ given non-collinear points.*
(a) two (b) three (c) four (d) five

11. *Chords equidistant from the centre of a circle are _____ in length.*
(a) half (b) one third (c) one fourth (d) equal

12. *The angle subtended by an arc at the centre is _____ the angle subtended by it at any point on the remaining part of the circle.*
(a) half (b) double (c) triple (d) equal

13. *Angles in the same segment of a circle are equal.*
(a) half (b) double (c) triple (d) equal

14. *The sum of either pair of opposite angles of a cyclic quadrilateral is _____.*
(a) 180°. (b) 360° (c) 90° (d) none of these

15. *If the sum of a pair of opposite angles of a quadrilateral is _____, the quadrilateral is cyclic.*
(a) 180°. (b) 360° (c) 90° (d) none of these

MCQ WORKSHEET-II

CLASS IX: CHAPTER – 10

CIRCLES

1. The length of a chord of circle of radius 10 cm is 12 cm. Determine the distance of the chord from the centre

(a) 8 cm (b) 7 cm (c) 6 cm (d) 5 cm

2. The length of a chord of circle is 4 cm. If its perpendicular distance from the centre is 1.5 cm, determine the radius of the circle.

(a) 2.5 cm (b) 1.5 cm (c) 6 cm (d) 5 cm

3. The radius of the circle is 5 cm and distance of the chord from the centre of the circle is 4 cm. Find the length of the chord.

(a) 8 cm (b) 7 cm (c) 6 cm (d) 5 cm

4. Find the length of a chord, which is at a distance of 24 cm from the centre of a circle whose diameter is 50 cm.

(a) 12 cm (b) 14 cm (c) 16 cm (d) 15 cm

5. Two points A and B are 16 cm apart. A circle with radius 17 cm is drawn to pass through these points. Find the distance of AB from the centre of the circle.

(a) 12 cm (b) 14 cm (c) 16 cm (d) 15 cm

6. If the length of a chord of a circle at a distance of 5 cm from the centre of the circle is 24 cm, find the radius of the circle.

(a) 13 cm (b) 14 cm (c) 16 cm (d) 15 cm

7. A chord 6 cm long is drawn in a circle with a diameter equal to 10 cm. Find its perpendicular distance from the centre.

(a) 4 cm (b) 7 cm (c) 6 cm (d) 5 cm

8. If the length of a chord of a circle at a distance of 24 cm from the centre of the circle is 36 cm, find the length of the greatest chord of the circle.

(a) 80 cm (b) 70 cm (c) 60 cm (d) 50 cm

9. AB is a chord of the circle with centre O and radius 13 cm. If OM $\perp$ AB and OM =5 cm, find th length of the chord AB.

(a) 24 cm (b) 27 cm (c) 26 cm (d) 25 cm

10. A chord of a circle of radius 7.5 cm with centre O is of length 9 cm. Find the its distance from the centre.

(a) 4 cm (b) 7 cm (c) 6 cm (d) 5 cm

11. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

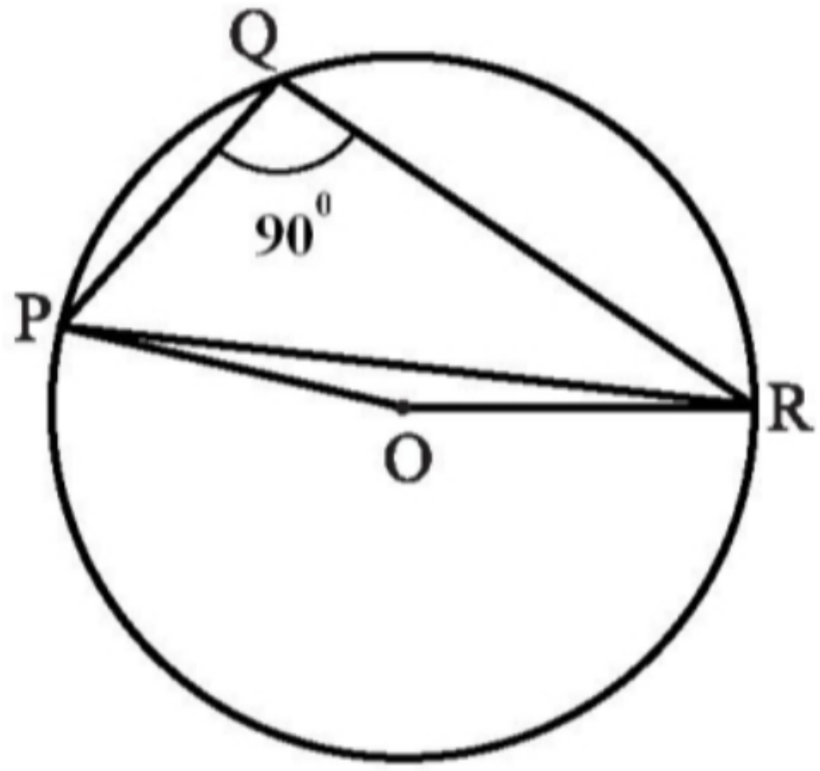
(a) 4 cm (b) 7 cm (c) 6 cm (d) 5 cm

12. In a circle of radius 25 cm, AB and AC are two chords, such that AB = AC = 30 cm . Find the length of the chord.

(a) 40 cm (b) 48 cm (c) 60 cm (d) 50 cm

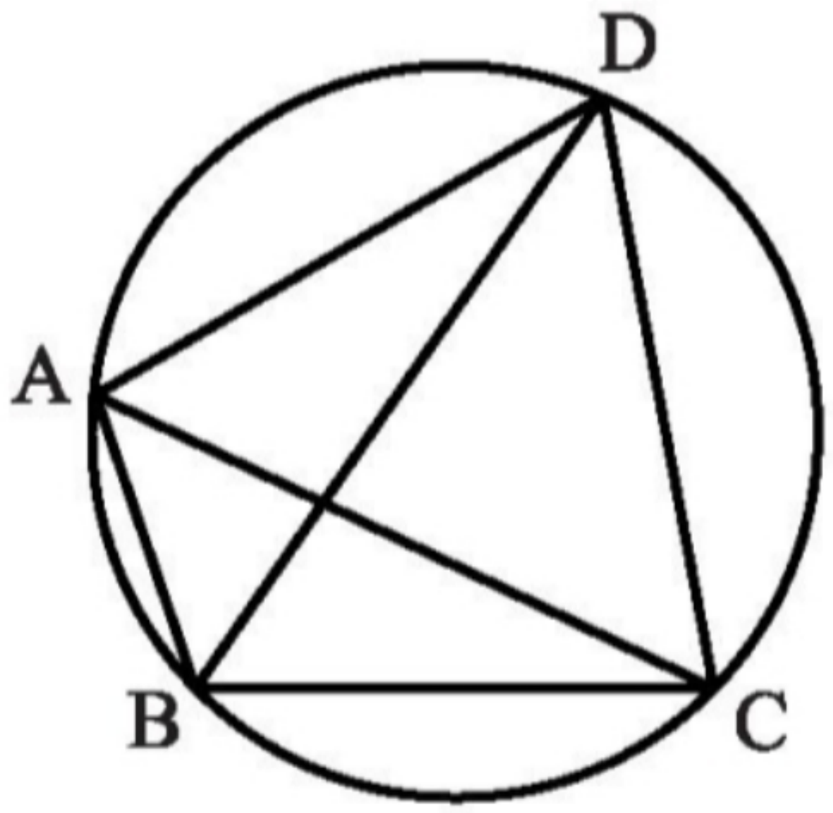
9. In the above figure, $\angle PQR = 90°$, where P, Q and R are points on a circle with centre O. Find reflex$\angle POR$.

(a) 180° (b) 140° (c) 45° (d) none of these



10. In below Fig, ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If $\angle$ DBC = 60° and $\angle BAC = 30°$, find $\angle BCD$.

(a) 80° (b) 60° (c) 90° (d) none of these



CIRCLES

1. Distance of chord AB from the centre is 12 cm and length of the chord is 10 cm. Then diameter of the circle is

A. 26 cm B. 13 cm C. $\sqrt{244}$ cm D. 20 cm

2. Two circles are drawn with side AB and AC of a triangle ABC as diameters. Circles intersect at a point D, Then

A. $\angle$ADB and $\angle$ADC are equal B. $\angle$ADB and $\angle$ADC are compementary

C. Points B, D, C are collinear D. none of these

3. The region between a chord and either of the arcs is called

A. an arc B. a sector C. a segment D. a semicircle

4. A circle divides the plane in which it lies, including circle in

A. 2 parts B. 3 parts C. 4 parts D. 5 parts

5. If diagonals of a cyclic quadrilateral are the diameters of a circle through the vertices of a quadrilateral, then quadrilateral is a

A. parallelogram B. square C. rectangle D. trapezium

6. Given three non collinear points, then the number of circles which can be drawn through these three points are

A. one B. zero C. two D. infinite

Distance of chord AB from the centre is 12 cm and length of the chord is 10cm. Then diameter of the circle is

7. In a circle with centre O, AB and CD are two diameters perpendicular to each other. The length of chord AC is

A. 2 AB B. $\sqrt{2}$ AB C. $\frac{1}{2}$AB D. $\frac{1}{\sqrt{2}}$AB

8. If AB is a chord of a circle, P and Q are the two points on the circle different from A and B, then

A. $\angle APB = \angle AQB$

B. $\angle APB + \angle AQB = 180^o$

C. $\angle APB + \angle AQB = 90^o$

D. $\angle APB + \angle AQB = 180^o$

8. ABCD is a cyclic quadrilateral. If $\angle BCD = 100°$, $\angle ABD$ is $30°$, find $\angle ABD$.

(a) $80°$ (b) $60°$ (c) $90°$ (d) 70^0

9. ABCD is a cyclic quadrilateral. If $\angle DBC = 80°$, $\angle BAC$ is $40°$, find $\angle BCD$.

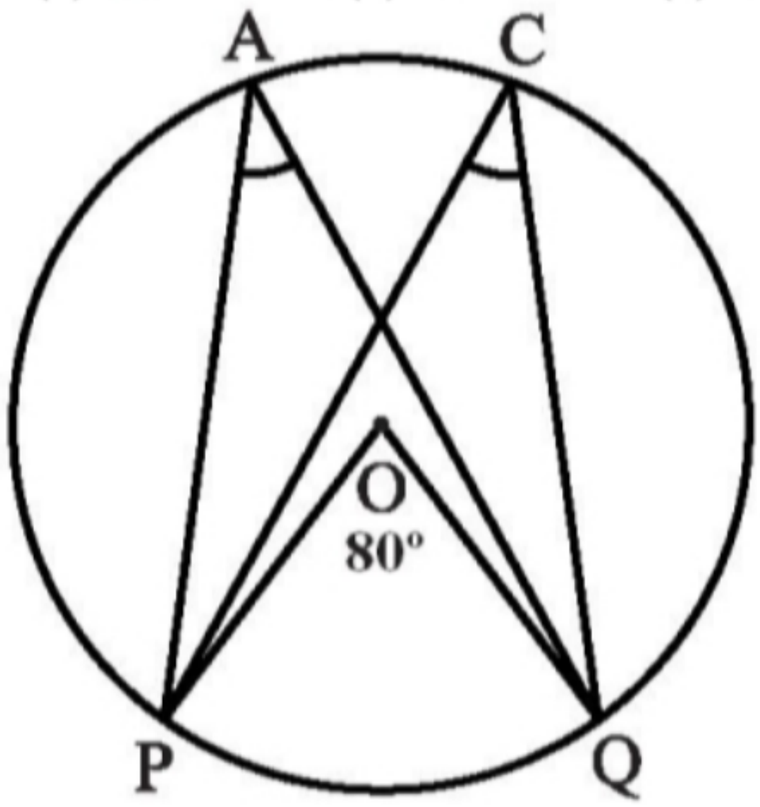
(a) $80°$ (b) $60°$ (c) $90°$ (d) 70^0

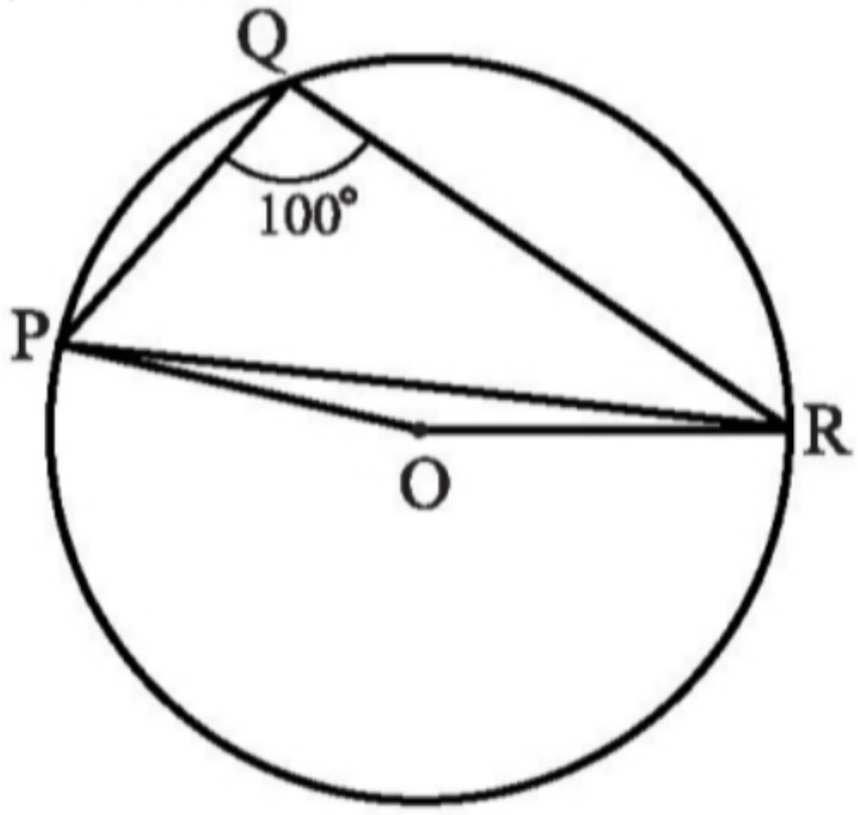
10. ABCD is a cyclic quadrilateral in which BC is parallel to AD, $\angle ADC = 110^0$ and $\angle BAC = 50^0$. Find $\angle DAC$

(a) $80°$ (b) $60°$ (c) $90°$ (d) 170^0

11. In the below figure, $\angle POQ = 80^0$, find $\angle PAQ$

(a) $80°$ (b) $40°$ (c) $100°$ (d) none of these





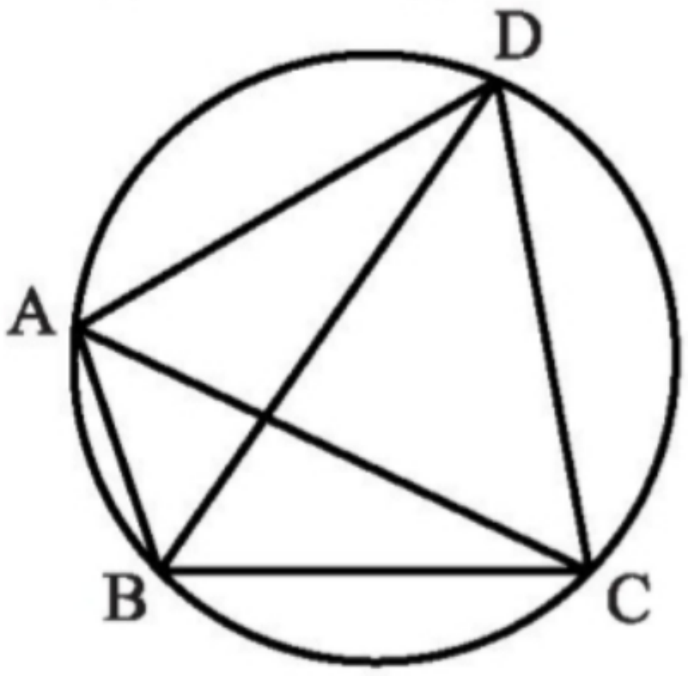
12. In the above figure, $\angle PQR = 100°$, where P, Q and R are points on a circle with centre O. Find $\angle OPR$.

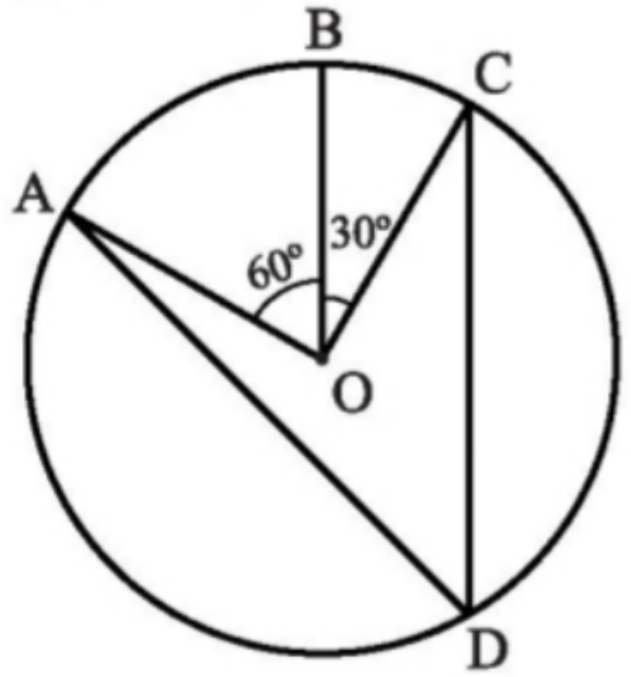
(a) $80°$ (b) $40°$ (c) $10°$ (d) none of these

CIRCLES

1. In below Fig, ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If $\angle$ DBC = 55° and $\angle$BAC = 45°, find $\angle$BCD.

(a) 80º (b) 60º (c) 90º (d) none of these





2. In above sided Fig, A,B and C are three points on a circle with centre O such that $\angle$BOC = 30° and $\angle$AOB = 60°. If D is a point on the circle other than the arc ABC, find $\angle$ADC.

(a) 45º (b) 60º (c) 90º (d) none of these

3. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc

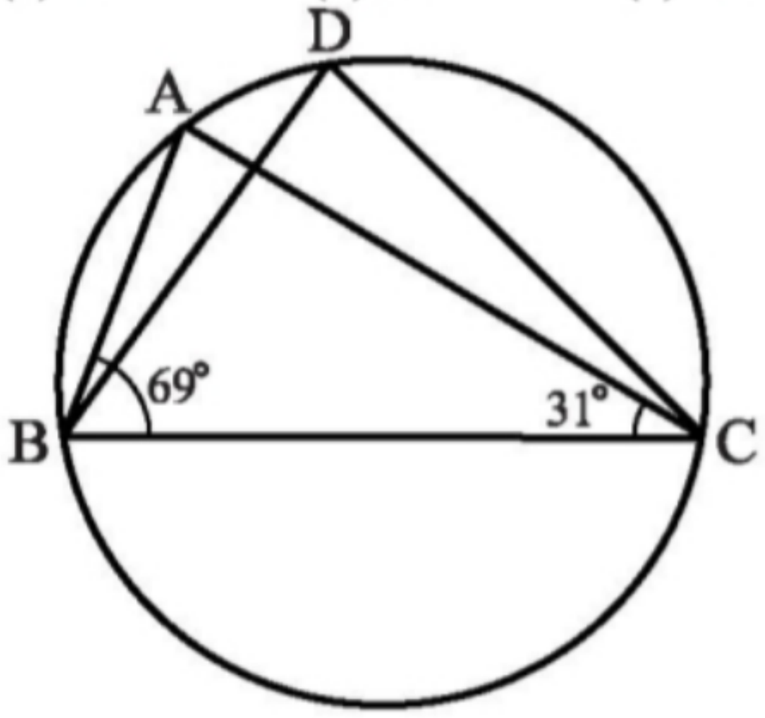
(a) 150^0 (b) 30º (c) 60º (d) none of these

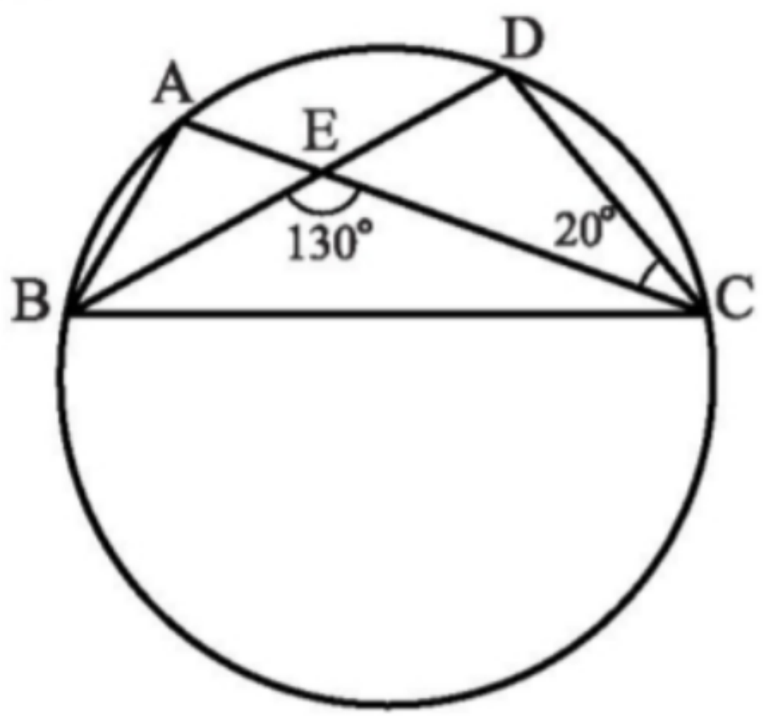
4. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the major arc.

(a) 150^0 (b) 30º (c) 60º (d) none of these

5. In the below Fig., $\angle$ABC = 69°, $\angle$ACB = 31°, find $\angle$BDC.

(a) 80º (b) 60º (c) 90º (d) 100^0





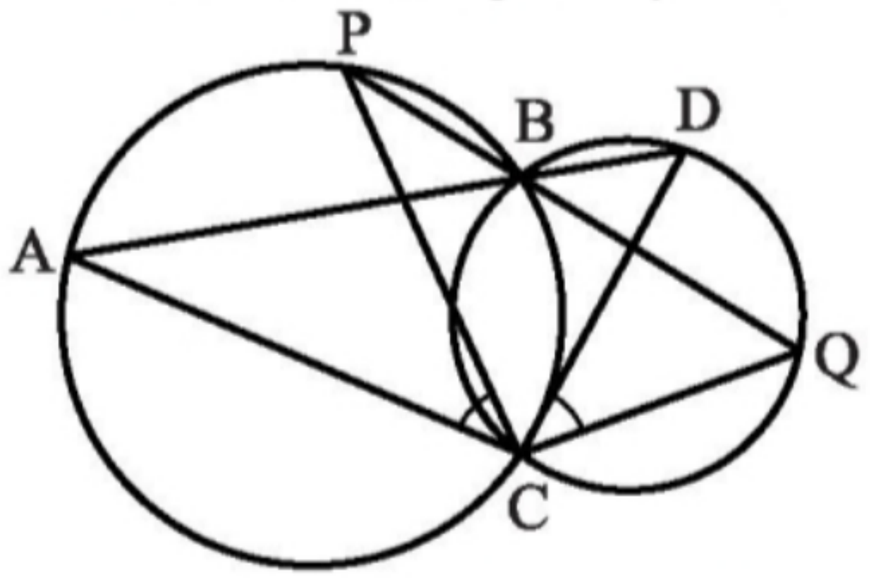
6. In the above sided Fig., A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle$BEC = 130° and $\angle$ECD = 20°. Find $\angle$BAC.

(a) 110º (b) 150º (c) 90º (d) 100^0

7. ABCD is a cyclic quadrilateral whose diagonals intersect at a point E. If $\angle$DBC = 70°, $\angle$BAC is 30°, find $\angle$BCD.

(a) 80º (b) 60º (c) 90º (d) 100^0

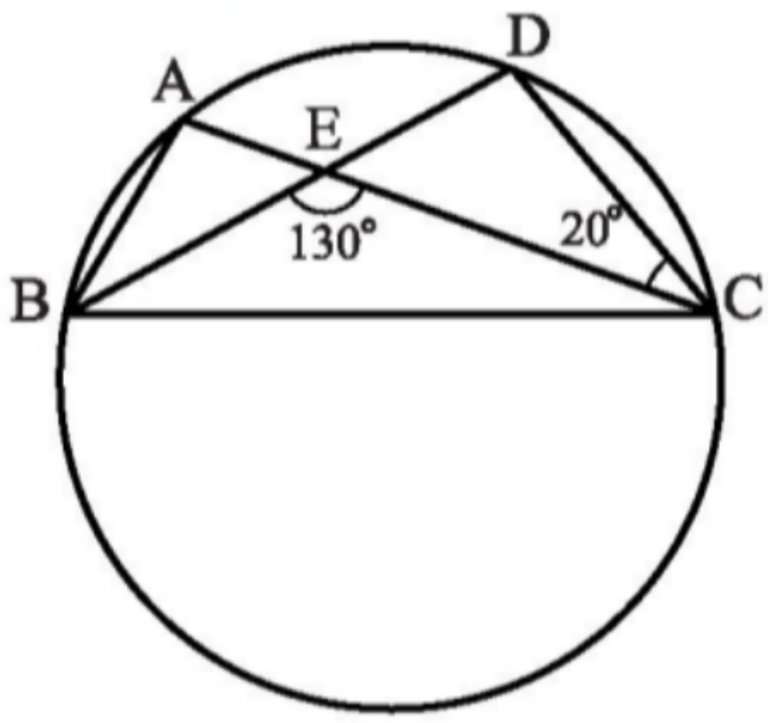
47. Two circles intersect at two points B and C. Through B, two line segments ABD and PBQ are drawn to intersect the circles at A, D and P, Q respectively. Prove that $\angle ACP = \angle QCD$.

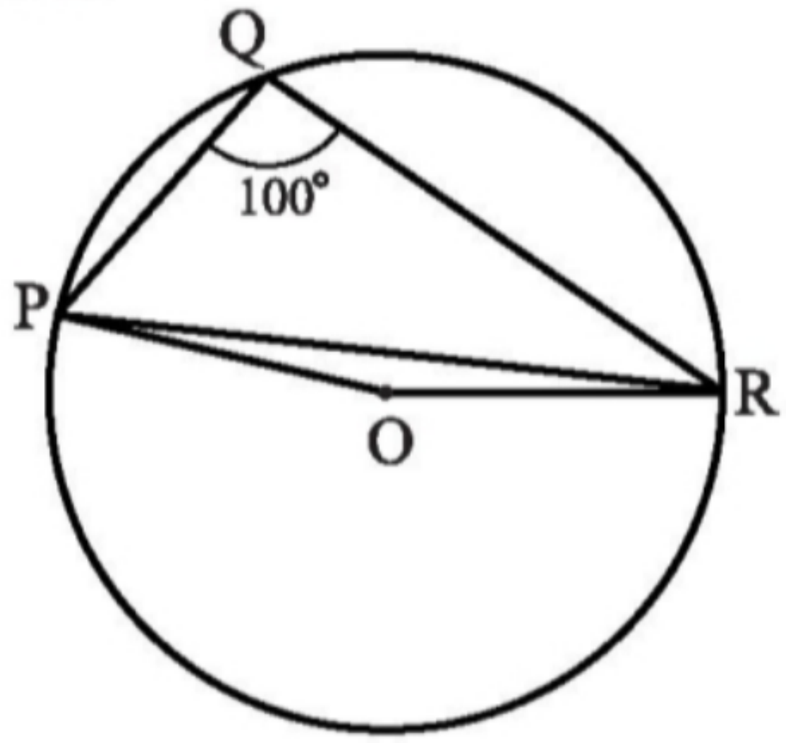


48. If circles are drawn taking two sides of a triangle as diameters, prove that the point of intersection of these circles lie on the third side.

49. Prove that the circle drawn with any side of a rhombus as diameter, passes through the point of intersection of its diagonals.

50. In the adjoining figure, A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle BEC = 130°$ and $\angle ECD = 20°$. Find $\angle BAC$.





51. In the above right-sided figure, $\angle PQR = 100°$, where P, Q and R are points on a circle with centre O. Find $\angle OPR$.

52. ABCD is a parallelogram. The circle through A, B and C intersect CD (produced if necessary) at E. Prove that AE = AD.

53. AC and BD are chords of a circle which bisect each other. Prove that (i) AC and BD are diameters, (ii) ABCD is a rectangle.

54. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.

55. Prove that the circle drawn with any side of a rhombus as a diameter, passes through the point of its diagonals.

56. Bisectors of angles A, B and C of a triangles ABC intersect its circumcircle at D, E and F respectively. Prove that the angles of DDEF are $90^0 - \frac{A}{2}$, $90^0 - \frac{B}{2}$ and $90^0 - \frac{C}{2}$

57. Prove that the line of centres of two intersecting circles subtends equal angles at the two points of intersection.

33. The diagonals of a cyclic quadrilateral are at right angles. Prove that perpendiculars from the point of their intersection on any side when produced backward bisect the opposite side.

34. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.

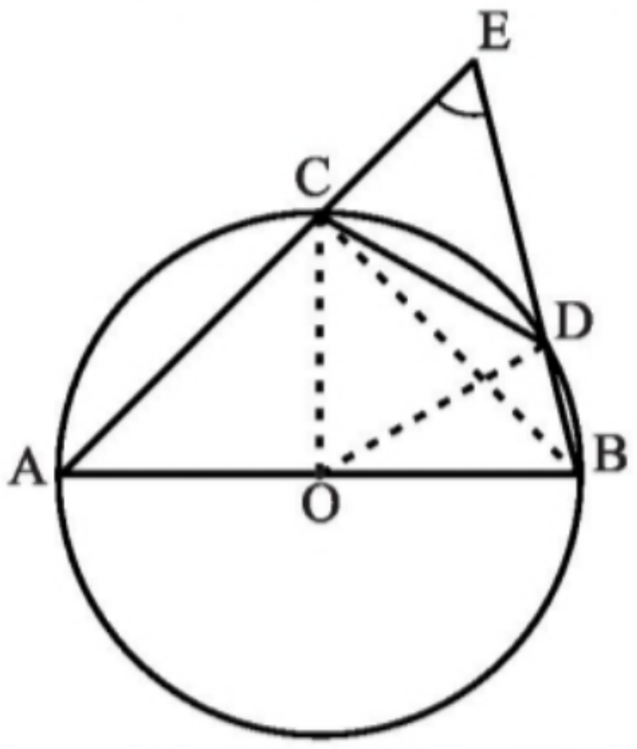
35. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.

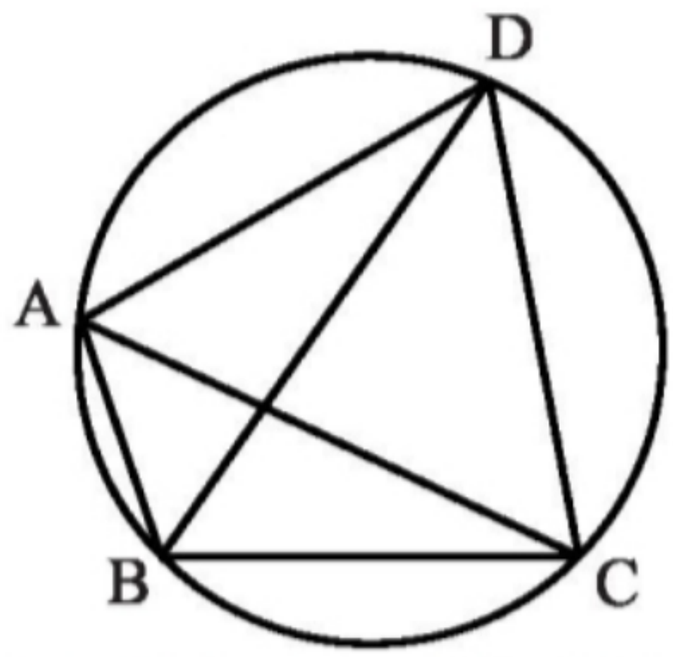
36. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

37. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.

38. If two equal chords of a circle intersect within the circle, prove that the line joining the point of intersection to the centre makes equal angles with the chords.

39. In the below figure, AB is a diameter of the circle, CD is a chord equal to the radius of the circle. AC and BD when extended intersect at a point E. Prove that $\angle AEB = 60°$.





40. In the above right-sided figure, ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If $\angle DBC = 55°$ and $\angle BAC = 45°$, find $\angle BCD$.

41. Prove that the quadrilateral formed (if possible) by the internal angle bisectors of any quadrilateral is cyclic.

42. ABCD is a cyclic quadrilateral whose diagonals intersect at a point E. If $\angle DBC = 70°$, $\angle BAC$ is $30°$, find $\angle BCD$. Further, if AB = BC, find $\angle ECD$.

43. If diagonals of a cyclic quadrilateral are diameters of the circle through the vertices of the quadrilateral, prove that it is a rectangle.

44. Two circles intersect at two points A and B. AD and AC are diameters to the two circles. Prove that B lies on the line segment DC.

45. Prove that the quadrilateral formed (if possible) by the internal angle bisectors of any quadrilateral is cyclic.

46. If the non-parallel sides of a trapezium are equal, prove that it is cyclic.

21. Prove that *"If one side of the cyclic quadrilateral is produced then the exterior angle is equal to the interior opposite angle."*

22. Prove that *"If two sides of a cyclic quadrilateral are parallel, then the remaining two sides are equal and the diagonals are also equal."*

23. Prove that *"If two opposite sides of cyclic quadrilateral are equal, then the other two sides are parallel."*

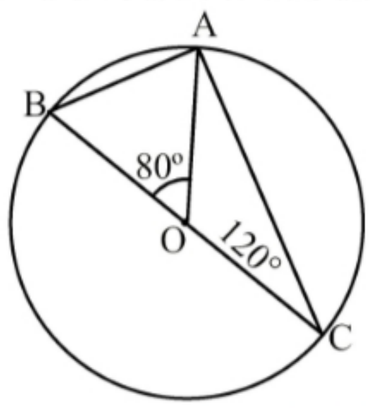
24. Prove that *"If two non parallel sides of a trapezium are equal, it is cyclic."*

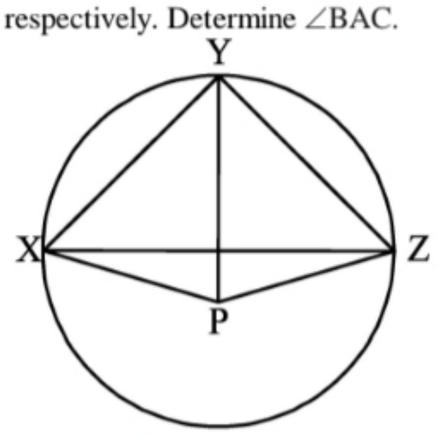
25. Prove that *"The sum of the angles in the four segments exterior to a cyclic quadrilateral is equal to 6 right angles."*

26. Two circles with centres A and B intersect at C and D. Prove that $\angle ACB = \angle ADB$.

27. Bisector AD of AC of ΔABC passes through the centre of the circumcircle of ΔABC. Prove that AB = AC.

28. In the below figure A, B and C are three points on a circle such that angles subtended by the chords AB and AC at the centre O are 80^0 and 120^0 respectively. Determine $\angle BAC$.

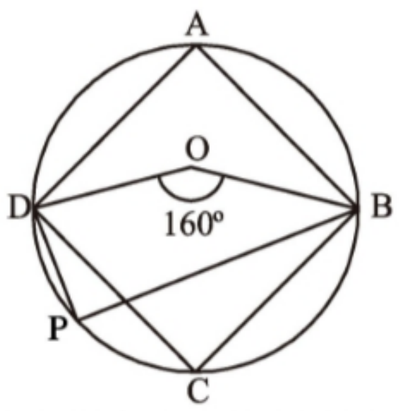




29. In the above right-sided figure, P is the centre of the circle. Prove that $\angle XPZ = 2\ (\angle XZY + \angle YXZ)$.

30. Prove that the midpoint of the hypotenuse of a right triangle is equidistant from its vertices.

31. In the below figure ABCD is a cyclic quadrilateral, O is the centre of the circle. If $\angle BOD = 160^0$, find $\angle BPD$.



32. Prove that in a triangle if the bisector of any angle and the perpendicular bisector of its opposite side intersect, they will intersect on the circumcircle of the triangle.

33. The diagonals of a cyclic quadrilateral are at right angles. Prove that perpendiculars from the point of their intersection on any side when produced backward bisect the opposite side.

34. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.

35. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.

36. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

PRACTICE QUESTIONS

CHAPTER – 10: CIRCLES

1. Prove that *"Equal chords of a circle subtend equal angles at the centre".*

2. Prove that *"Chords of a circle which subtends equal angles at the centre are equal".*

3. Prove that *"The perpendicular from the centre of a circle to a chord bisects the chord."*

4. Prove that *"The line drawn through the centre of a circle to bisect a chord is perpendicular to the chord".*

5. Prove that *"Chords equidistant from the centre of a circle are equal in length"*

6. Prove that *"Chords of a circle which are equidistant from the centre are equal"*

7. Prove that *"Of any two chords of a circle then the one which is larger is nearer to the centre."*

8. Prove that *"Of any two chords of a circle then the one which is nearer to the centre is larger."*

9. Prove that *"line joining the midpoints of two equal chords of circle subtends equal angles with the chord."*

10. *Prove that "if two chords of a circle bisect each other they must be diameters.*

11. If two chords of a circle are equally inclined to the diameter through their point of intersection, prove that the chords are equal.

12. Prove that *"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."*

13. Prove that *"Angles in the same segment of a circle are equal."*

14. Prove that *"Angle in a semicircle is a right angle."*

15. Prove that *"Arc of a circle subtending a right angle at any point of the circle in its alternate segment is a semicircle."*

16. Prove that *"Any angle subtended by a minor arc in the alternate segment is acute and any angle subtended by a major arc in the alternate segment is obtuse."*

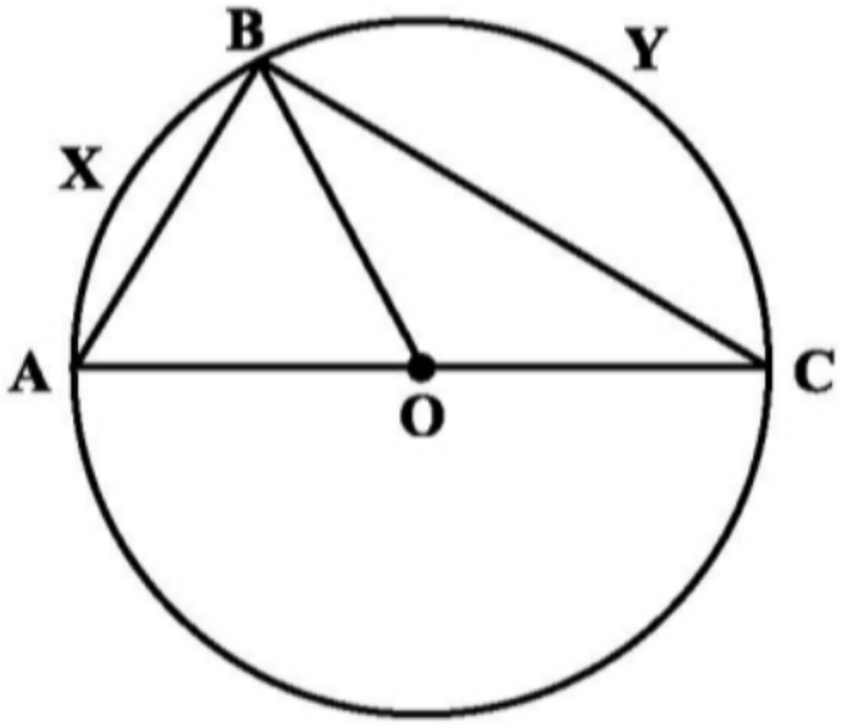
17. Prove that *"If a line segment joining two points subtends equal angles at two other points lying on the same side of the line segment, the four points are concyclic."*

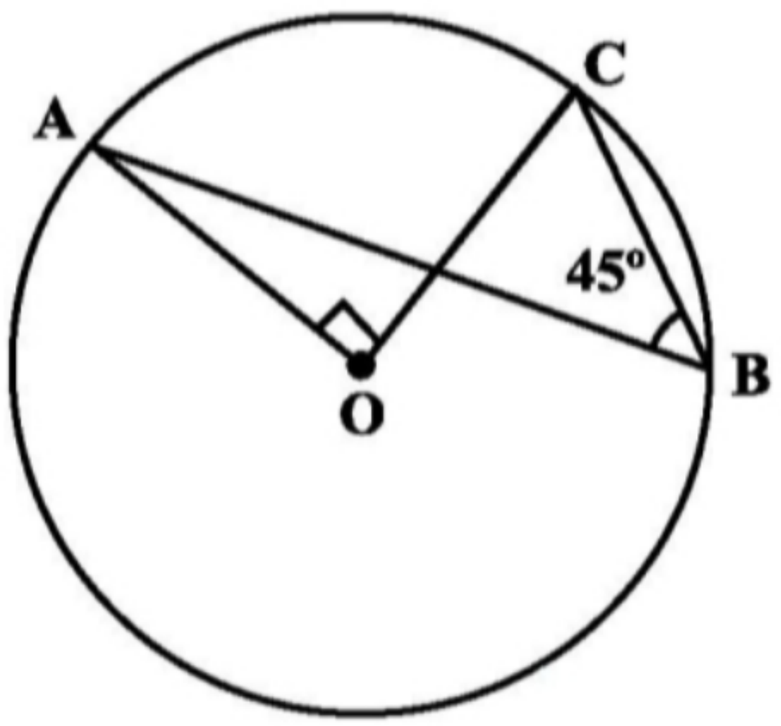
18. Prove that *"Circle drawn on any one side of the equal sides of an isosceles trainlge as diameter bisects the side."*

19. Prove that *"The sum of either pair of opposite angles of a cyclic quadrilateral is* 180°."

20. Prove that *"If the sum of a pair of opposite angles of a quadrilateral is* 180°, *the quadrilateral is cyclic."*

79. In the below figure, AOC is a diameter of the circle and arc(AXB) = $\frac{1}{2}$ arc(BYC). Find $\angle$BOC.





80. In the above right sided figure, $\angle ABC = 45^0$, prove that OA $\perp$ OC.

81. Two chords AB and AC of a circle subtends angles equal to 90ϕ and 150ϕ, respectively at the centre. Find $\angle$BAC, if AB and AC lie on the opposite sides of the centre.

82. 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.

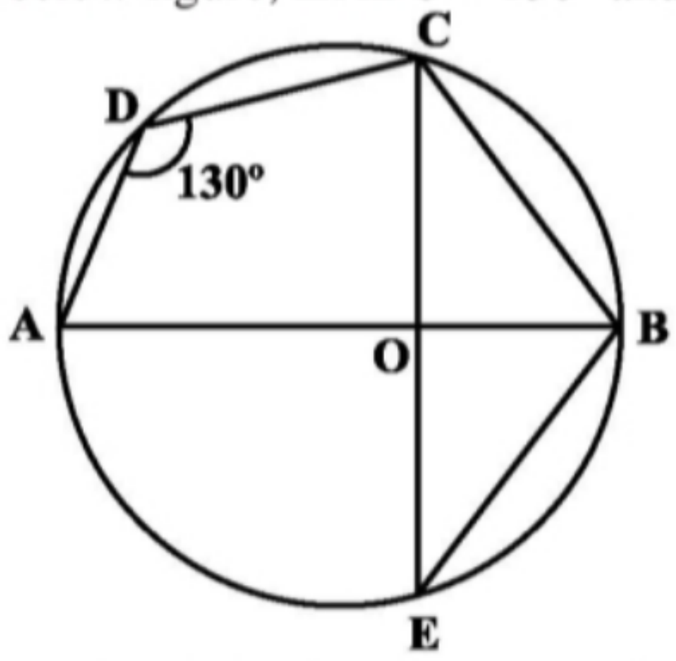
83. If a line is drawn parallel to the base of an isosceles triangle to intersect its equal sides, prove that the quadrilateral so formed is cyclic.

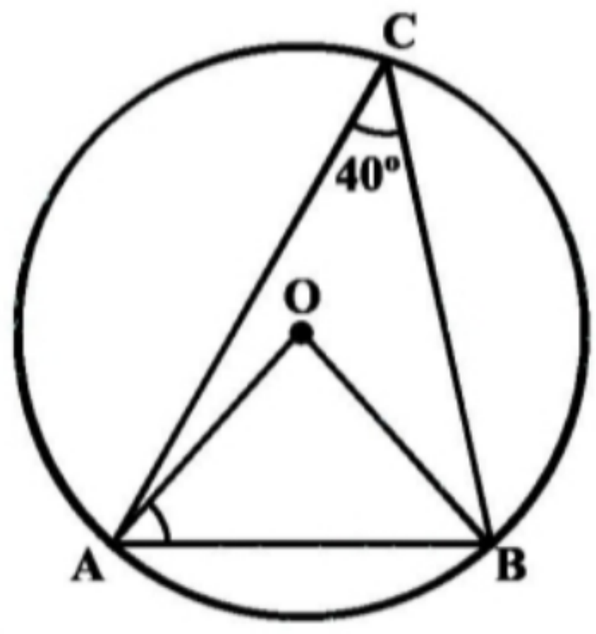
84. If a pair of opposite sides of a cyclic quadrilateral are equal, prove that its diagonals are also equal.

85. The circumcentre of the triangle ABC is O. Prove that $\angle OBC + \angle BAC = 90^0$.

86. A chord of a circle is equal to its radius. Find the angle subtended by this chord at a point in major segment.

87. In the below figure, $\angle ADC = 130°$ and chord BC = chord BE. Find $\angle$CBE.





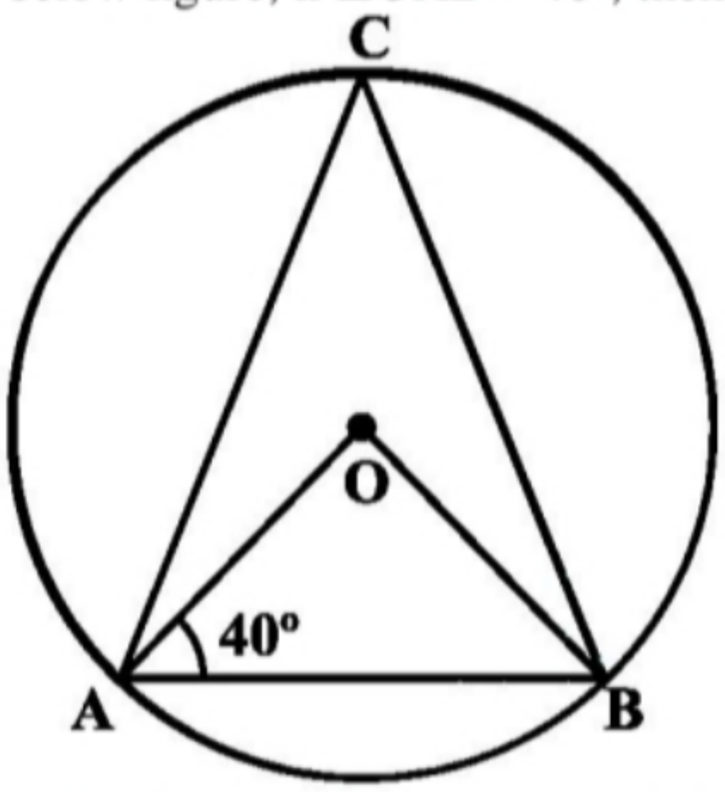
88. In the above right sided figure, $\angle ACB = 40^0$. Find $\angle$OAB.

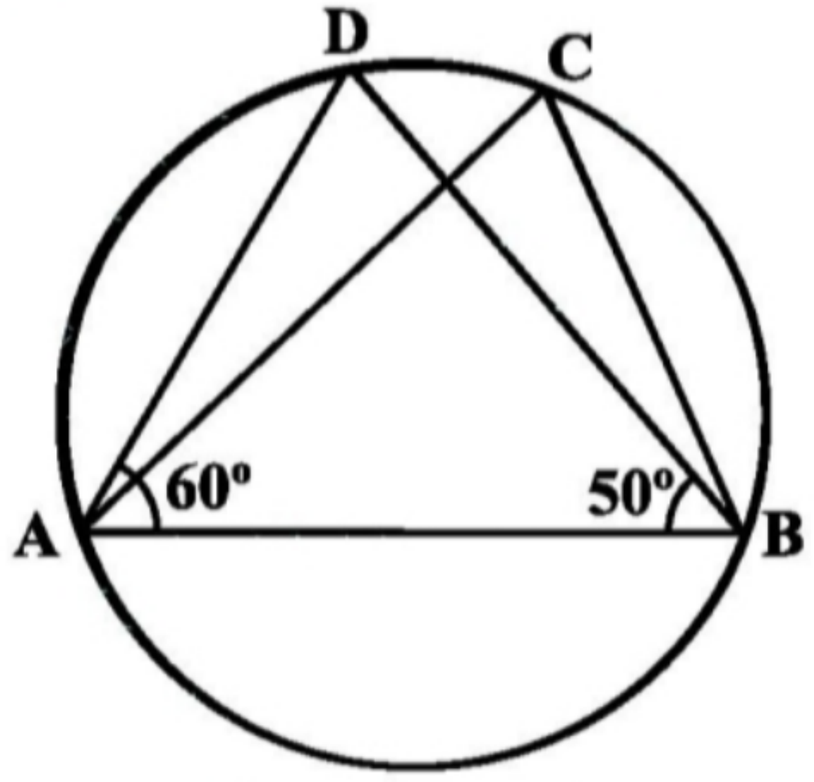
89. A quadrilateral ABCD is inscribed in a circle such that AB is a diameter and $\angle ADC = 130^0$. Find $\angle$BAC.

90. 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'

68. 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.

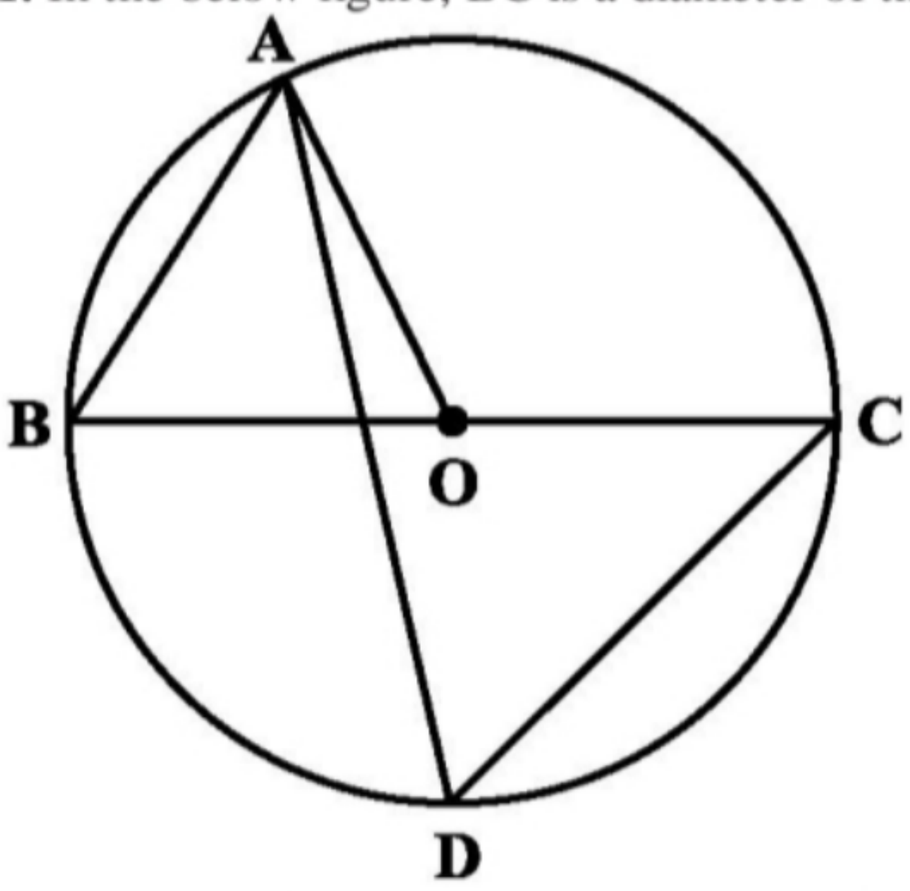
69. In the below figure, if $\angle OAB = 40^0$, then find $\angle ACB$

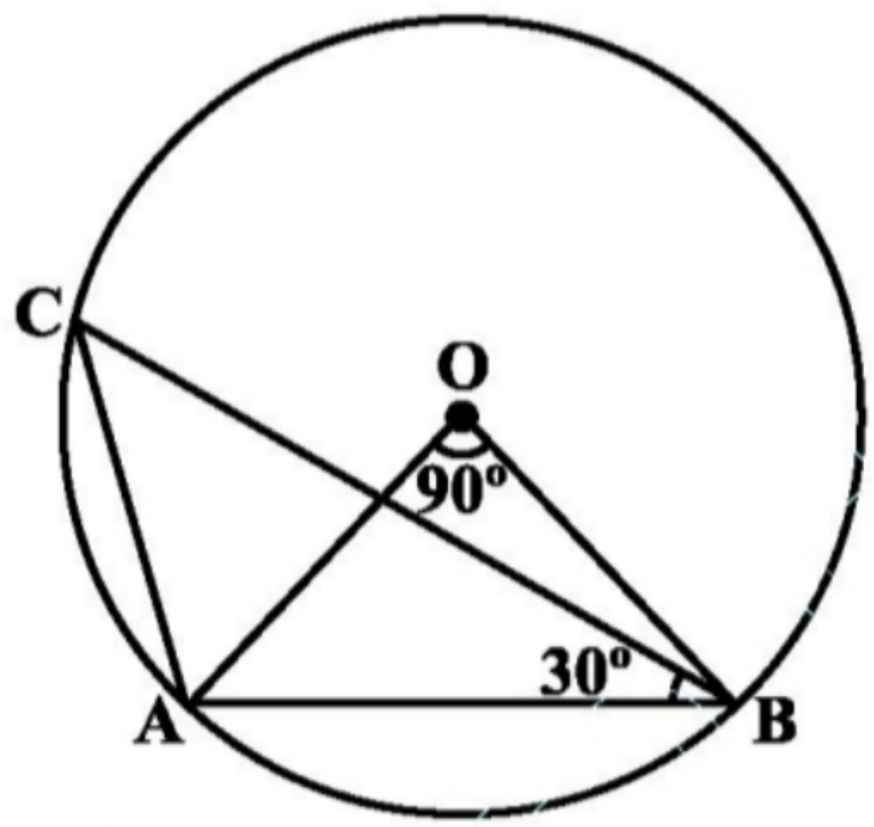




70. In the above right sided figure, if $\angle DAB = 60^0$, $\angle ABD = 50^0$ then find $\angle ACB$.

71. In the below figure, BC is a diameter of the circle and $\angle BAO = 60^0$ then find $\angle ADC$





72. In above right sided figure, $\angle AOB = 90^0$ and $\angle ABC = 30^0$, then find $\angle CAO$

73. The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, what is the distance of the other chord from the centre?

74. A, B, C D are four consecutive points on a circle such that AB = CD. Prove that AC = BD.

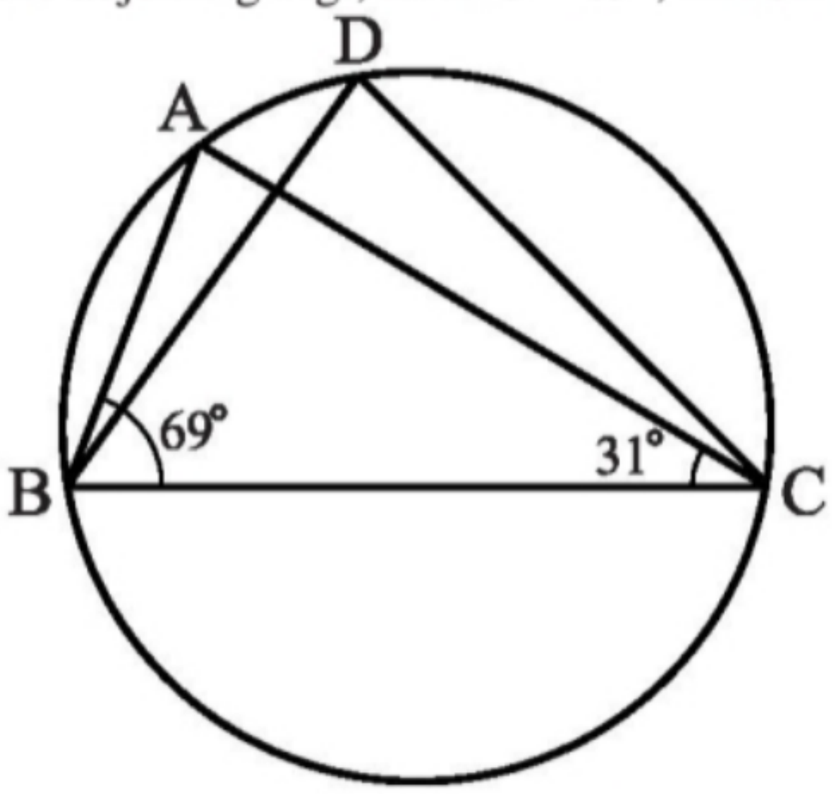
75. If a line segment joining mid-points of two chords of a circle passes through the centre of the circle, prove that the two chords are parallel.

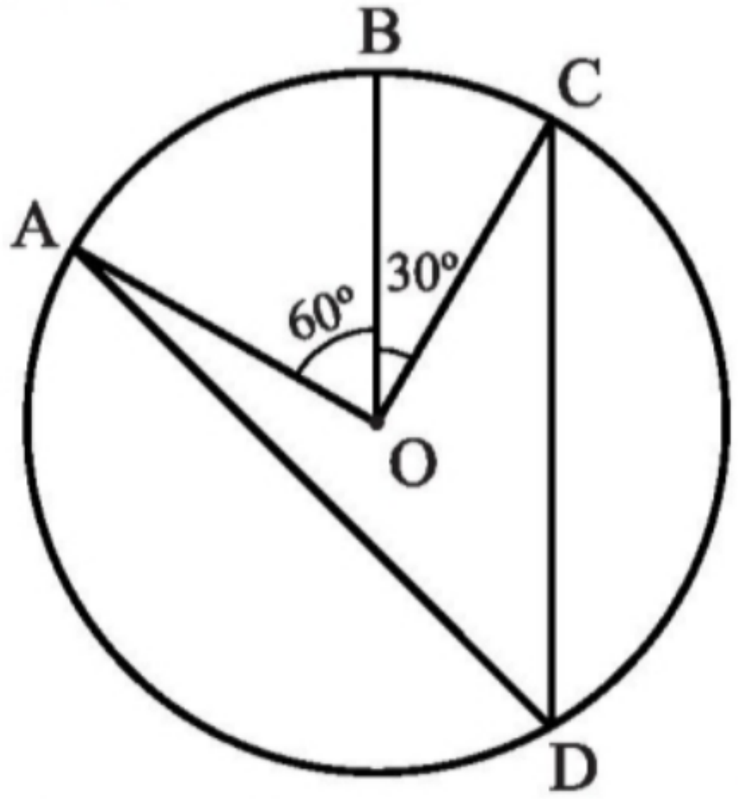
76. ABCD is such a quadrilateral that A is the centre of the circle passing through B, C and D. Prove that $\angle CBD + \angle CDB = \frac{1}{2}\angle BAD$

77. O is the circumcentre of the triangle ABC and D is the mid-point of the base BC. Prove that $\angle BOD = \angle A$.

78. On a common hypotenuse AB, two right triangles ACB and ADB are situated on opposite sides. Prove that $\angle BAC = \angle BDC$.

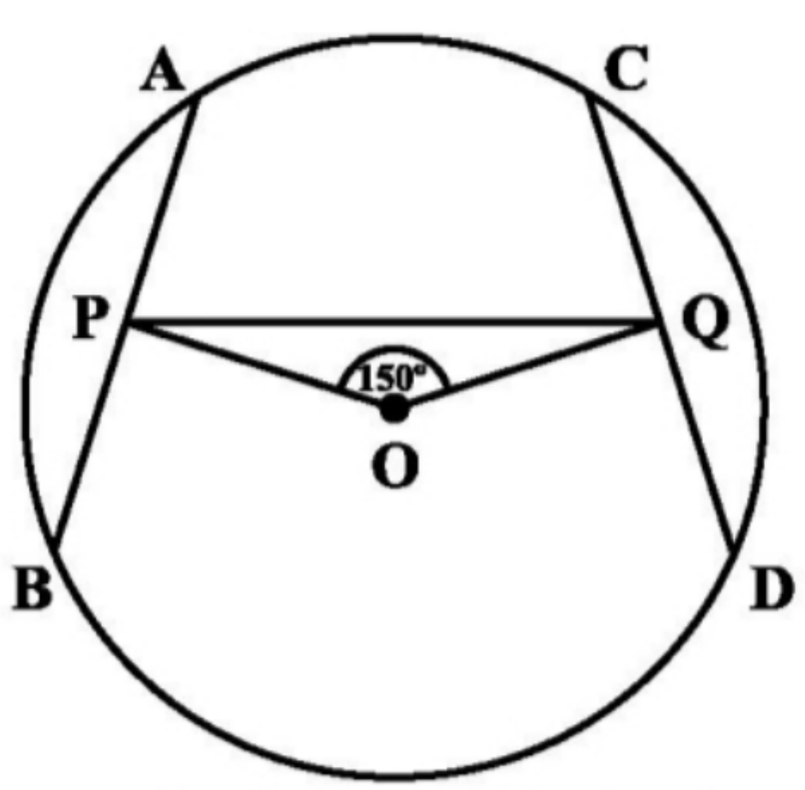
58. In the adjoining Fig., $\angle ABC = 69°$, $\angle ACB = 31°$, find $\angle BDC$.

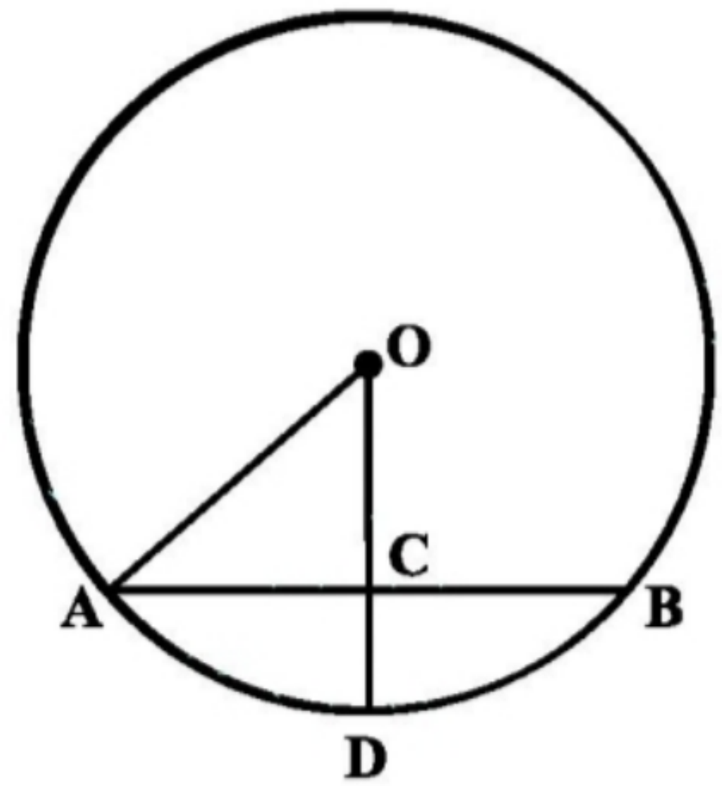




59. In the above right-sided figure, A,B and C are three points on a circle with centre O such that $\angle BOC = 30°$ and $\angle AOB = 60°$. If D is a point on the circle other than the arc ABC, find $\angle ADC$.

60. In the below figure, AB and CD are two equal chords of a circle with centre O. OP and OQ are perpendiculars on chords AB and CD, respectively. If $\angle POQ = 150°$, then find $\angle APQ$.





61. In the above right sided figure, if OA = 5 cm, AB = 8 cm and OD is perpendicular to AB, then find CD.

62. Two chords AB and CD of lengths 5 cm and 11 cm respectively of a circle are parallel to each other and are on opposite sides of its centre. If the distance between AB and CD is 6 cm, find the radius of the circle.

63. Two congruent circles intersect each other at points A and B. Through A any line segment PAQ is drawn so that P, Q lie on the two circles. Prove that BP = BQ.

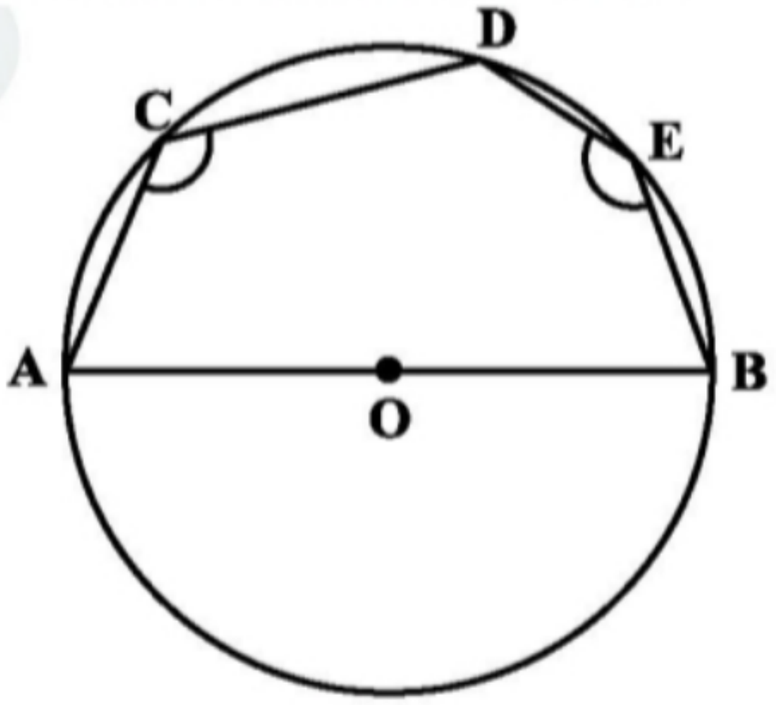
64. In any triangle ABC, if the angle bisector of $\angle A$ and perpendicular bisector of BC intersect, prove that they intersect on the circumcircle of the triangle ABC.

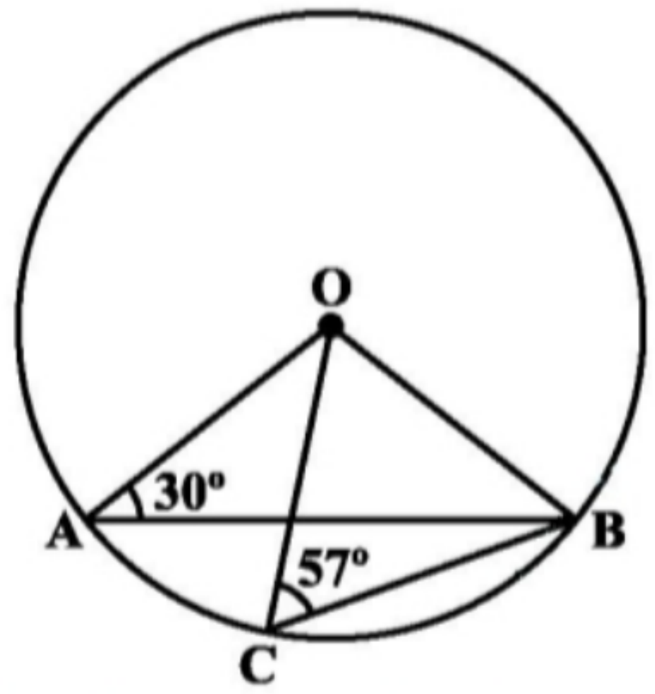
65. If arcs AXB and CYD of a circle are congruent, find the ratio of AB and CD.

66. If the perpendicular bisector of a chord AB of a circle PXAQBY intersects the circle at P and Q, prove that arc PXA $\cong$ Arc PYB.

67. A, B and C are three points on a circle. Prove that the perpendicular bisectors of AB, BC and CA are concurrent.

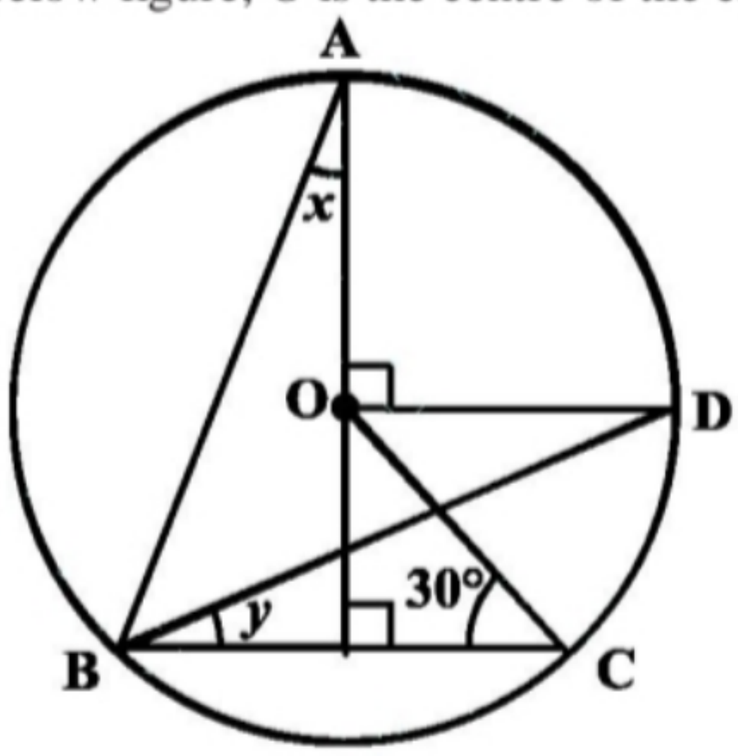
91. In the below figure, AOB is a diameter of the circle and C, D, E are any three points on the semi-circle. Find the value of $\angle ACD + \angle BED$.

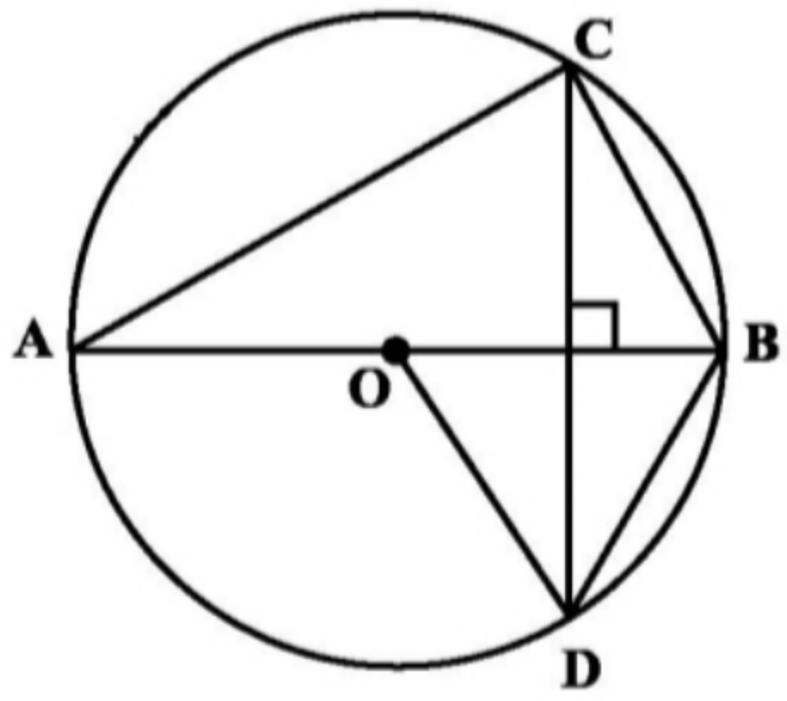




92. In the above right sided figure, $\angle OAB = 30^0$ and $\angle OCB = 57^0$. Find $\angle BOC$ and $\angle AOC$.

93. In the below figure, O is the centre of the circle, $\angle BCO = 30^0$, find x and y.





94. In the above right sided figure, O is the centre of the circle, BD = OD and CD ⊥ AB. Find $\angle CAB$.

95. Let the vertex of an angle ABC be located outside a circle and let the sides of the angle intersect equal chords AD and CE with the circle. Prove that $\angle ABC$ is equal to half the difference of the angles subtended by the chords AC and DE at the centre.