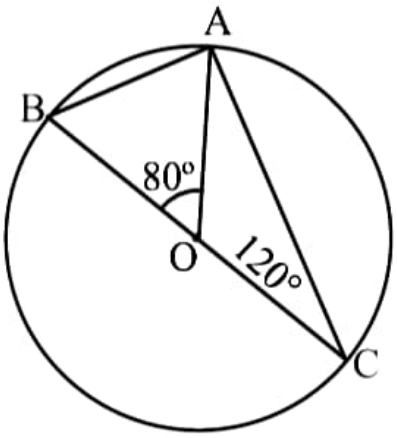
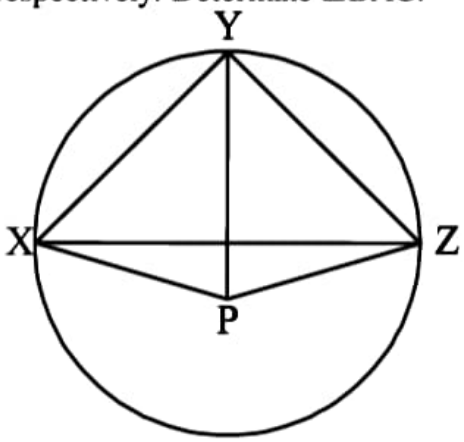
26. Two circles with centres A and B intersect at C and D. Prove that $\angle ACB = \angle ADB$.

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 $\angle BAC$.

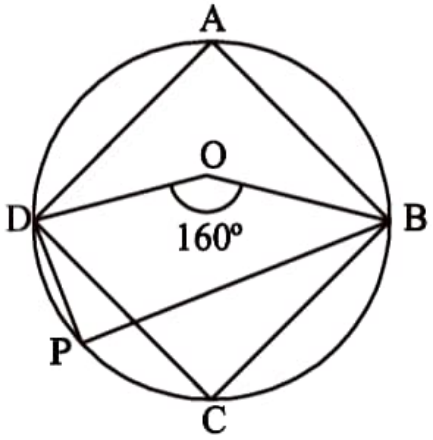




29. In the above right-sided figure, P is the centre of the circle. Prove that $\angle XPZ = 2\,(\angle XZY + \angle YXZ)$.

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.

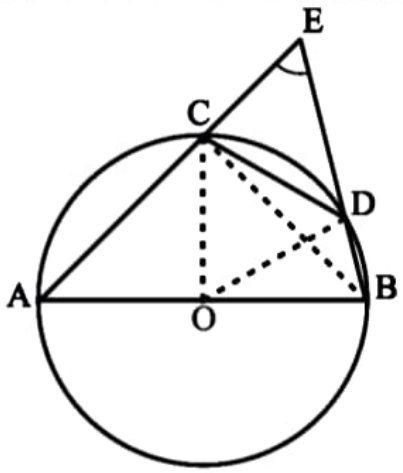
35. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.

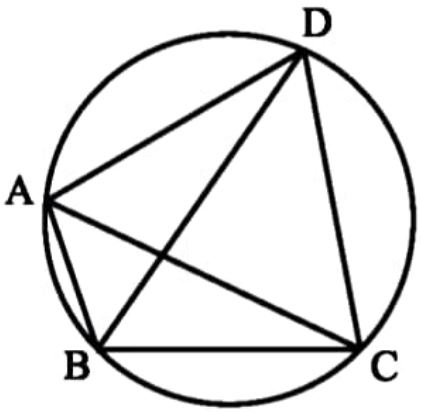
36. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

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 $\angle ECD$.

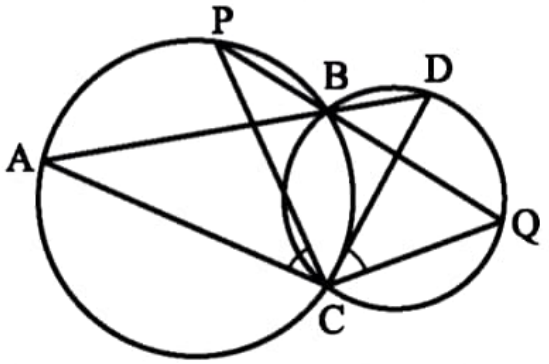
43. If diagonals of a cyclic quadrilateral are diameters of the circle through the vertices of the quadrilateral, prove that it is a rectangle.

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.

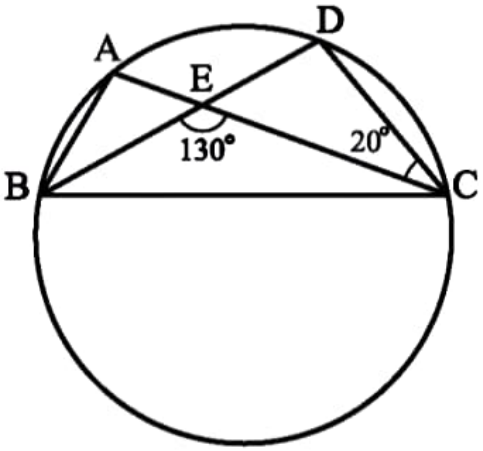
47. Two circles intersect at two points B and C. Through B, two line segments ABD and PBQ are drawn to intersect the circles at A, D and P, Q respectively. Prove that $\angle ACP = \angle QCD$.

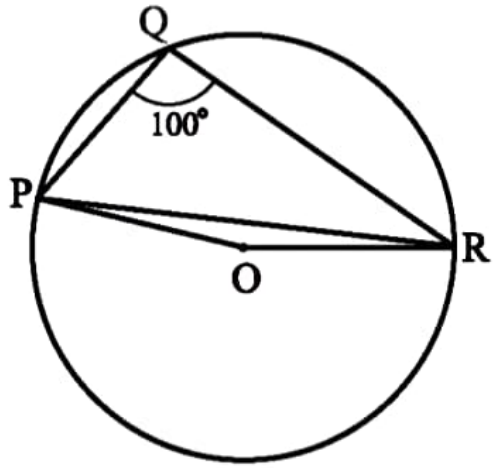


48. If circles are drawn taking two sides of a triangle as diameters, prove that the point of intersection of these circles lie on the third side.

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.

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.