MATHS

BOOKS - NAVBODH MATHS (HINGLISH)

CIRCLES

Exercise 10 1 Fill In The Blanks

1. Fill in the blanks: (i) The centre of a circle lies in of the circle. (exterior/ interior) (ii) A point, whose distance from the centre of a circle is

greater than its radius lies in of the circle. (exterior/ interior) (iii) The longest cho

2. Fill in the blanks: (i) The centre of a circle lies in of the circle. (exterior/ interior) (ii) A point, whose distance from the centre of a circle is greater than its radius lies in of the circle. (exterior/ interior) (iii) The longest cho

3. Fill in the blanks: All point lying inside/outside a circle are called ... points/ ... points. Circle having the same centre and different radii are called ... circles. A point whose distance from the centre of a circle is greater than its radius lies in .... of the circle. A continuous piece of a circle is .... of the circle. The longest chord of a circle is a ......of the circle. An arc is a .... when its ends are the ends of a diameter. Segment of a circle is the region between an arc and ... of the circle. A

circle divides the plane, on which it lies, in ....
parts.

4. Fill in the blanks: All point lying inside/outside a circle are called ... points/ ... points. Circle having the same centre and different radii are called ... circles. A point whose distance from the centre of a circle is greater than its radius lies in .... of the circle. A continuous piece of a circle is .... of the circle.

The longest chord of a circle is a ......of the circle. An arc is a .... when its ends are the ends of a diameter. Segment of a circle is the region between an arc and ... of the circle. A circle divides the plane, on which it lies, in .... parts.

5. Fill in the blanks: All point lying inside/outside a circle are called ... points/ ... points. Circle having the same centre and

different radii are called ... circles. A point whose distance from the centre of a circle is greater than its radius lies in .... of the circle. A continuous piece of a circle is .... of the circle. The longest chord of a circle is a ......of the circle. An arc is a .... when its ends are the ends of a diameter. Segment of a circle is the region between an arc and ... of the circle. A circle divides the plane, on which it lies, in .... parts.

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6. Fill in the blanks: All point lying inside/outside a circle are called ... points/ ... points. Circle having the same centre and different radii are called ... circles. A point whose distance from the centre of a circle is greater than its radius lies in .... of the circle. A continuous piece of a circle is .... of the circle. The longest chord of a circle is a ......of the circle. An arc is a .... when its ends are the ends of a diameter. Segment of a circle is the region between an arc and ... of the circle. A circle divides the plane, on which it lies, in .... parts.

Exercise 10 1 True Or False

1. Write True or False: Give reasons for your answers. (i) Line segment joining the centre to any point on the circle is a radius of the circle. (ii) A circle has only finite number of equal chords. (iii) If a circle is divided into three equa

2. A cirlce can have only a finite number of equal chords.

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6. Write the truth value (T/F) of the following with suitable reasons: A circle is a plane figure. Line segment joining the centre to any point on the circle is a radius of the circle. If a circle is divided into three equal arcs each is a major arc. A circle has only finite number of equal chords. A chord of a circle, which is twice as

long is its radius is a diameter of the circle.

Sector is the region between the chord and its corresponding arc. The degree measure of an arc is the complement of the central angle containing the arc. The degree measure of a semi-circle is 180^0

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Exercise 10 2

1. Recall that two circles are congruent if they have the same radii. Prove that equal chords of congruent circles subtend equal angles at their centres.

2. Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal.

1. Draw different pairs of circles. How many

points does each pair have in common ? What

is the maximum number of common points ?

Pairs of circles	No. of common points
	0
	1
	2
	1
	0

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2. Suppose you are given a circle. Give a construction to find its centre.

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

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Exercise 10 4

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

2. 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.

3. 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.

4. If a line intersects two concentric circles (circles with the same centre) with centre O at

A, B, C and D, prove that AB = CD (see Fig. 10.25).

5. Three girls Reshma, Salma and Mandip are playing a game by standing on a circle of radius 5m drawn in a park. Reshma throws a ball to Salma, Salma to Mandip, Mandip to Reshma. If the distance between Reshma and Salma and between Salma and Mandip

6. A circular park of radius $20m$ is situated in a colony. Three boys Ankur, Syed and David are sitting at equal distance on its boundary each having a toy telephone in his hands to talk to each other. Find the length of the string of each phone.

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Exercise 10 5

1. In Fig. 10.36, A,B and C are three points on a circle with centre O such that $\angle BOC\ =\ 30o$ and $\angle AOB\ =\ 60o$. If D is a point on the circle other than the arc ABC, find $\angle ADC$.

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2. A chord of a circle is equal to the radius of the circle find the angle subtended by the
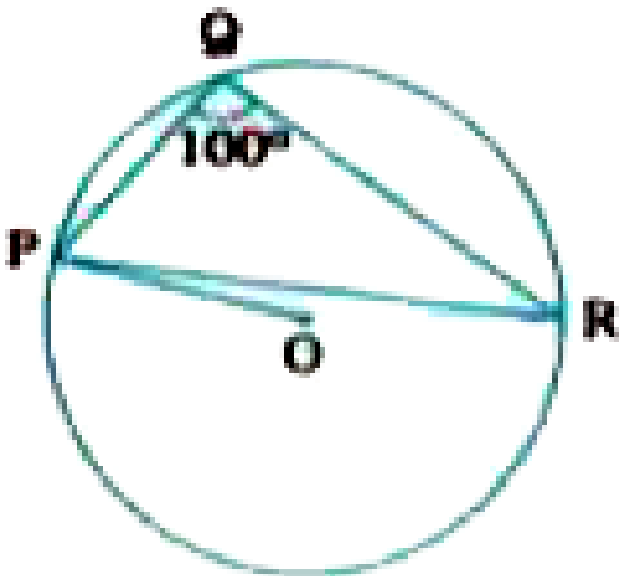
chord at a point on the monor arc and also at

a point on the major arc.

3. In the given figure, $\angle PQR = 100°$, where

P, 9 and R are points on a circle with centre O.

Find $\angle OPR$.

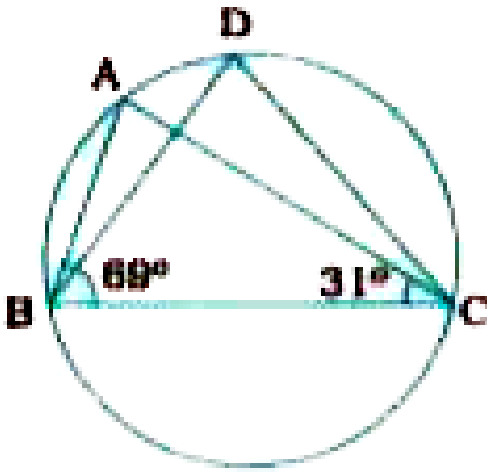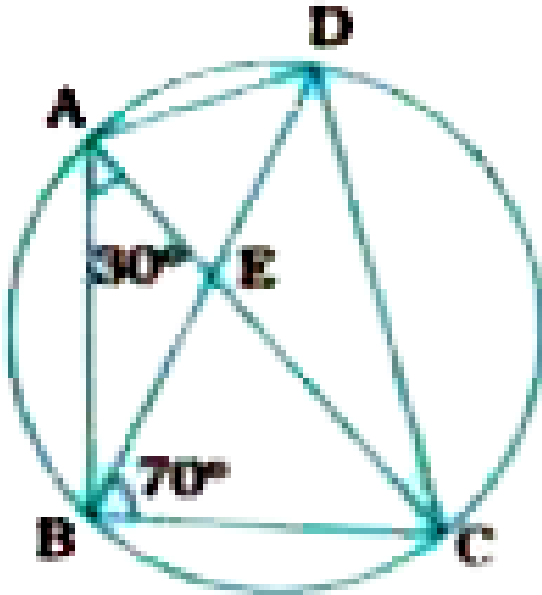**4.** In the given figure, $\angle ABC = 69°$, $\angle ACB = 31°$,find $\angle BDC$

5. 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 $\angle ECD$.

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

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

8. 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 (see Fig. 10.40). Prove that

$\angle ACP = \angle QCD.$

9. 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

10. ABC and ADC are two right triangles with common hypotenuse $AC.$ Prove that $\angle CAD = \angle CBD.$

11. Prove that any cyclic parallelogram is a rectangle.

Exercise 10 6

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

2. 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.

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

4. 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

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

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

7. $AC \; and \; BD$ are chords of a circle which bisect each other. Prove that (i) $AC \; and \; BD$ are diameters (ii) $ABCD$ is a rectangle
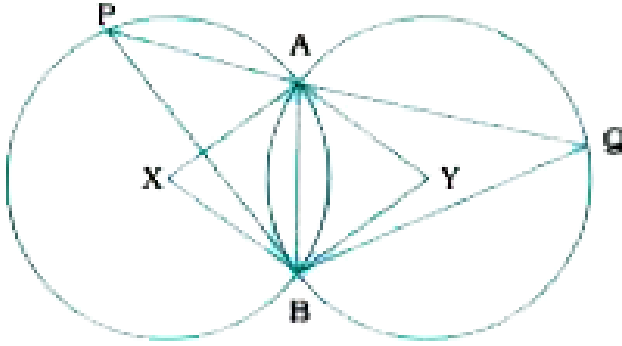
8. Bisectors of angles A, B and C of a triangle ABC intersect its circumcircle at D, E andF respectively. Prove that the angles of the triangle DEF are $90o - \frac{1}{2}A, 90o - \frac{1}{2}B$ and $90o - \frac{1}{2}C$

9. Two congruent circles intersect each other at points A and B. Through A any line segment PAS is drawn so that P, Olie on the two circles.

Prove that BP = BQ.

10. In any triangle ABC, if the angle bisector of

$\angle A$ and perpendicular bisector of BCintersect,

prove that they intersect on the circumcircle

of the triangle ABC

1. Two chords $AB \: and \: CD$ of a circle are parallel and a line l is the perpendicular bisector of AB. Show that l bisects CD

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2. In a circle with centre O, AB is a chord and BC is a diameter. From centre O. perpendicular

OD is drawn to chord AB. Prove that $OD = \dfrac{1}{2}AC.$.

3. AB is a chord of a circle with centre O and diameter 20 cm. If AB = 12 cm, find the distance of AB from O.

4. AB and CD are chords of a circle with centre O. AB = 48 cm and its distance from centre O is 10 cm. If the distance of CD from centre O is 24 cm, find the length of CD.

5. In a circle with centre O. AB and CD are parallel chords lying on opposite sides of a diameter parallel to them. If AB = 30 cm, CD -

48 cm and the distance between AB and CD is 27 cm, find the radius of the circle.

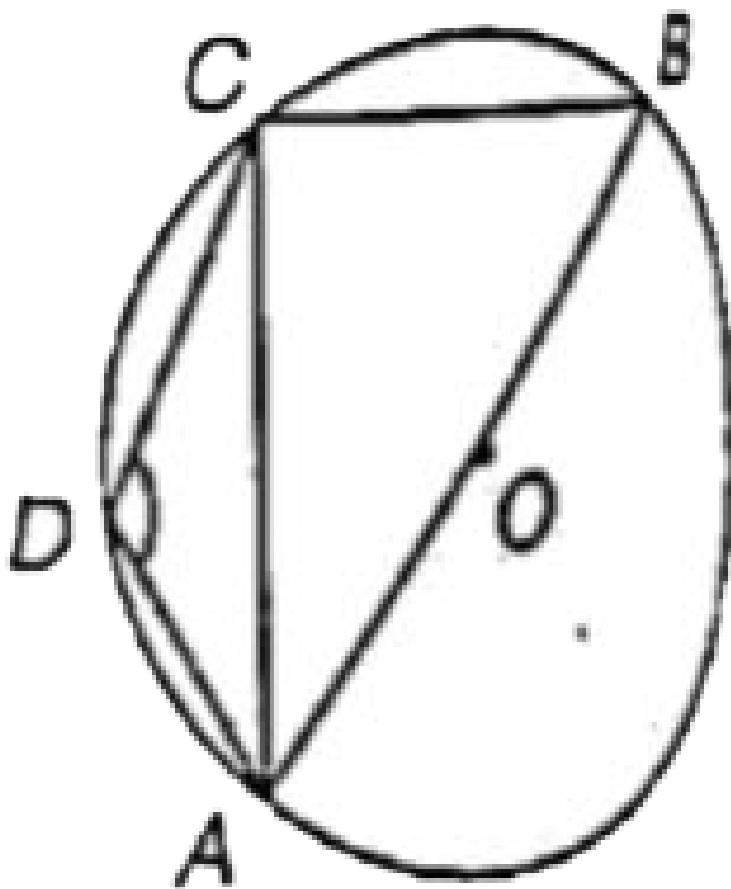**6.** ABCD is a cyclic quadrilateral. If $AD \mid\mid BC$ and $\angle B = 70°$, find the other angles of ABCD.

7. In cyclic quadrilateral $ABCD$, Diagonals AC and BD intersect at P. If $\angle DBC = 70°$ and $\angle BAC = 30°$ then find $\angle BCD$

8. In the given figure, ABCD is a cyclic quadrilateral and AB is diameter.

$\angle ADC = 140°$, then find $\angle BAC$:

9. In cyclic quadrilateral ABCD, $AD \mid\mid BC$. Prove that `AB = CD.

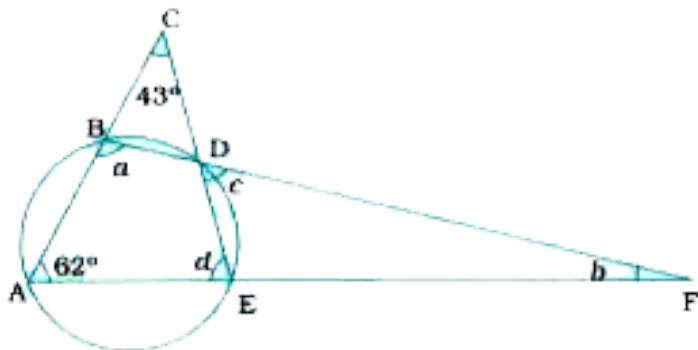**10.** In $\Delta ABC, AB = AC. A$ circle is drawn with diameter AB and it intersects BC at D. Prove that D is the midpoint of BC.

11. In the given figure, $\angle BCD = 43°$ and $\angle BAE = 62°$. Find the values of a, b, c and d.

Multiple Choice Questions Mcq S

1. In a circle with centre P. AB and CD are congruent chords. If $\angle PAB = 40°$, then $\angle CPD =$

    A. $40°$

    B. $80°$

    C. $100°$

    D. $50°$

Answer: C

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2. In a circle with radius 5 cm, the length of a chord lying at distance 4 cm from the centre is .... cm.

A. 3

B. 6

C. 12

D. 15

Answer: B

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3. In a circle with radius 13 cm, the length of a chord is 24 cm. Then, the distance of the chord from the centre is .... cm.

A. 10

B. 5

C. 12

D. 6.5

Answer: B

4. In a circle with radius 7 cm, the length of a minor arc is always less than .... cm.

A. 11

B. 22

C. 15

D. π

Answer: B

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5. In a circle with centre P, AB is a minor arc. Point Ris a point other than A and B on major arc   if $ANGLE\angle APB = 150°$.   then $\angle ARB = $ ....

A. $150°$

B. $75°$

C. $50°$

D. $100°$

Answer: B

6. In a circle with centre P, AB is a minor arc. Point R is a point other than A and B on major arc AB. If $\angle ARB = 80°$, then $\angle APB = $ ....

A. $40°$

B. $80°$

C. $160°$

D. $60°$

Answer: C

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7. In cyclic quadrilateral

$ABCD, \angle A - \angle C = 20°$. Then,$\angle A = $ ....

A. $20°$

B. $80°$

C. $100°$

D. $50°$

Answer: C

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8. In cyclic quadrilateral $PQRS$, $7\angle P = 2\angle R$

Then, $\angle P =$

    A. $20°$

    B. $40°$

    C. $140°$

    D. $100°$

Answer: B

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9. The measures of two angles of a cyclic quadrilateral are $40°$ and $110°$ Then, the measures of other two angles of the quadrilateral are ....

    A. $400°$ and $110°$

    B. $50°$ and $100°$

    C. $140°$ and $70°$

    D. $20°$ and $120°$

Answer: C

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10. In cyclic quadrilateral $PQRS$, $\angle SQR = 60°$ and $\angle QPR = 20°$. Then, $\angle QRS =$

A. $40°$

B. $60°$

C. $80°$

D. $100°$

Answer: D

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11. In cyclic quadrilateral ABCD, $\angle CAB = 30°$ and $\angle ABC = 100°$ Then, $\angle ADB =$

    A. $50°$

    B. $100°$

    C. $75°$

    D. $60°$

Answer: A

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12. Equilateral $\triangle$ ABC is inscribed in a circle with centre P. Then, $\angle BPC$ = ...

    A. $60\,^\circ$

    B. $90\,^\circ$

    C. $120\,^\circ$

    D. $75\,^\circ$

Answer: C

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13. A ABC is inscribed in a circle with centre o and radius 5 cm and AC is a diameter of the circle. If AB = 8 cm, then BC = ... cm.

A. 10

B. 8

C. 6

D. 15

Answer: C

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14. In cyclic quadrilateral ABCD, $\angle A = 70°$ and $\angle B + \angle C = 160°$. Then, $\angle B = $ ....

A. $35°$

B. $25°$

C. $50°$

D. $130°$

Answer: C

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1. Given an arc of a circle, complete the circle.
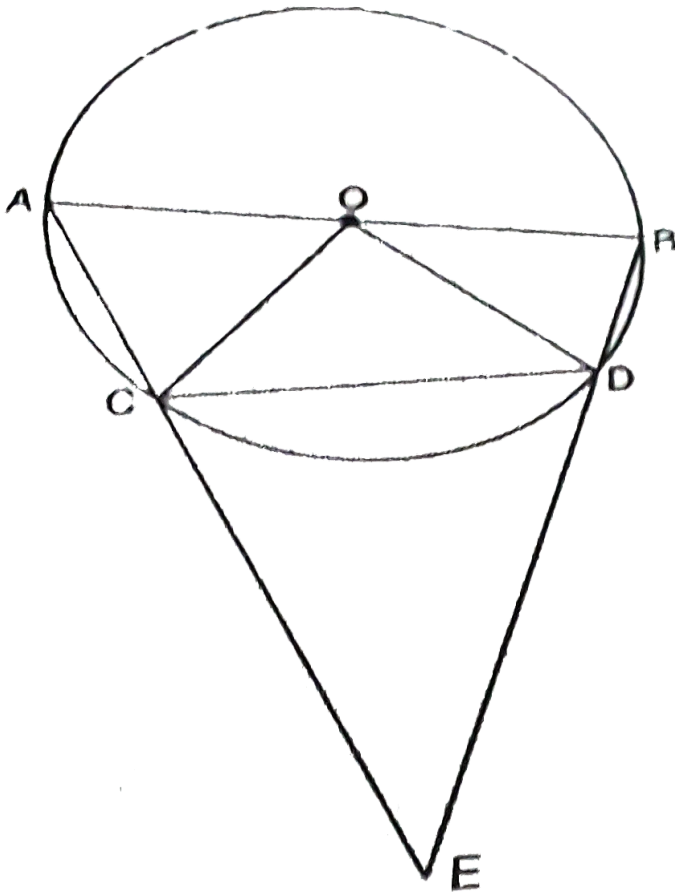
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2. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal

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3. In the adjoinig 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 $\angle AEB = 60°$.

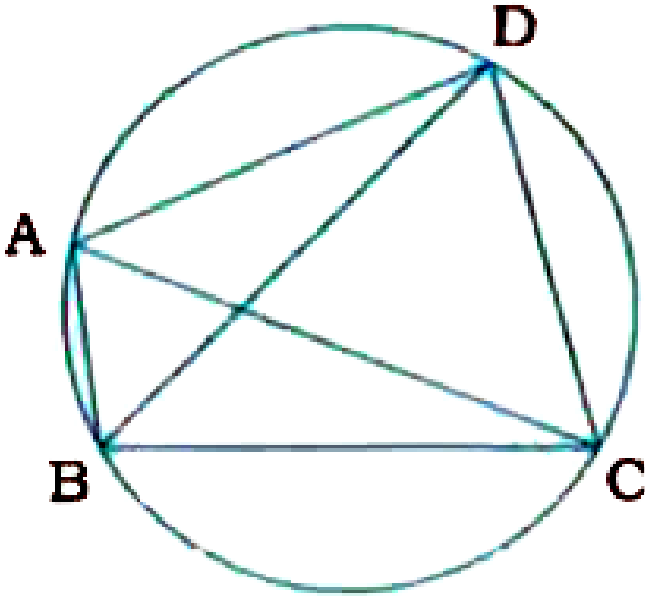**4.** In the given figure ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If $\angle DBC = 55°$ and $\angle BAC = 45°$, find

$\angle BCD$.
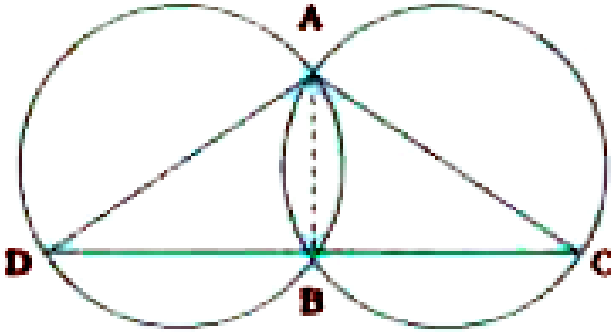
5. Two circles intersect at two points A and B .

AD and AC are diameters to the two circles

.Prove that B lies on the line segment DC.

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