



Class 9 Maths – Ganita Manjari

Chapter 5: I'm Up and Down, and Round and Round

Important Questions with Answer Key

New Syllabus 2026–27

These questions are selected from the chapter's **definitions, theorems, exercise sets and end-of-chapter applications**. The chapter covers circles, chords, perpendicular bisectors, angles subtended by arcs, cyclic quadrilaterals and concyclicity.

A. BASIC CONCEPTS

1. What is a circle?
 2. What is a chord of a circle?
 3. What is the diameter of a circle?
 4. What is the relationship between the radius and diameter?
 5. What is a cyclic quadrilateral?
 6. What does it mean for four points to be concyclic?
 7. How many circles can pass through three non-collinear points?
 8. Why can a circle not pass through three distinct collinear points?
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B. IMPORTANT THEOREMS

9. State the theorem about a line joining the centre of a circle to the midpoint of a chord.
10. State the converse of the theorem in Question 9.
11. Prove that the line joining the centre of a circle and the midpoint of a chord is perpendicular to the chord.

12. Prove that the perpendicular from the centre of a circle to a chord bisects the chord.
 13. State the theorem relating equal chords and their distances from the centre.
 14. State the theorem relating unequal chords and their distances from the centre.
 15. Prove that chords of equal length are equidistant from the centre.
 16. Which chord of a circle is closest to the centre?
 17. Which is the longest chord of a circle?
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C. ANGLES AND CHORDS

18. Two chords of a circle subtend equal angles at the centre. What can you conclude about their lengths?
 19. Prove that chords subtending equal angles at the centre are equal.
 20. If two chords of a circle are equal, what can you say about the angles they subtend at the centre?
 21. What is the relationship between the angle subtended by an arc at the centre and the angle subtended by the same arc at a point on the circle?
 22. An arc subtends an angle of 70° at the centre. Find the angle subtended by the same arc at a point on the circle.
 23. If an arc subtends an angle of 120° at the centre, what angle does it subtend at a point on the circle?
 24. State the corollary concerning the angle subtended by a diameter.
 25. If AB is a diameter and C is any point on the circle, find $\angle ACB$.
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D. CHORD-CENTRE NUMERICAL QUESTIONS

26. A chord is 5 cm from the centre of a circle whose radius is 13 cm. Find the length of the chord.
27. A circle has diameter 26 cm and a chord of length 24 cm. Find the distance of the chord from the centre.

28. A circle has radius 15 cm. A chord is 9 cm from the centre. Find the length of the chord.
29. A chord of length 16 cm is 6 cm from the centre. Find the radius of the circle.
30. A circle has radius 7 cm and the perpendicular distance of a chord from the centre is 6 cm. Find the length of the chord.
31. If the radius of a circle is r and the perpendicular distance of a chord from the centre is d , write the formula for the length of the chord.
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E. PARALLEL AND EQUAL CHORDS

32. Two parallel chords of lengths 6 cm and 8 cm lie on opposite sides of the centre of a circle of radius 5 cm. Find the distance between the midpoints of the chords.
33. If two chords are equidistant from the centre, what can you conclude about their lengths?
34. If one chord is longer than another chord, which one is closer to the centre?
35. Explain why the diameter is the greatest chord of a circle.
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F. CYCLIC QUADRILATERALS

36. State the theorem about the opposite angles of a cyclic quadrilateral.
37. ABCD is a cyclic quadrilateral. If $\angle A = 75^\circ$, find $\angle C$.
38. ABCD is cyclic. If $\angle B = 110^\circ$, find $\angle D$.
39. In a cyclic quadrilateral PQRS:
- $$\angle P = (2x + 10)^\circ$$
- $$\angle R = (3x - 20)^\circ$$
- Find x , $\angle P$ and $\angle R$.
40. If one angle of a cyclic quadrilateral is 90° , what is the measure of its opposite angle?
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G. CONCYCLICITY

41. What does it mean for four points to be concyclic?
42. State the theorem used to prove that four points are concyclic when a line segment subtends equal angles at two points on the same side.
43. If $\angle ACB = \angle ADB$ and C and D lie on the same side of AB, what can you conclude?
44. Why are the vertices of a cyclic quadrilateral called concyclic points?
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H. HIGH-ORDER / EXAM QUESTIONS

45. Prove that the perpendicular bisector of a chord passes through the centre of the circle.
46. An isosceles triangle ABC is inscribed in a circle with $AB = AC$. Prove that the altitude from A to BC passes through the centre.
47. Prove that chords of equal length are equidistant from the centre.
48. Prove that if two chords are equidistant from the centre, then they are equal.
49. Prove that the angle subtended by a diameter at any point on the circle is 90° .
50. Prove that the sum of two opposite angles of a cyclic quadrilateral is 180° .
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MOST IMPORTANT QUESTIONS

For your website's **Important Questions PDF**, I would especially mark these:

- ★ 1. Unique circle through three non-collinear points.
- ★ 2. Prove that the line joining the centre to the midpoint of a chord is perpendicular to the chord.
- ★ 3. Prove the converse: perpendicular from centre to chord bisects the chord.
- ★ 4. Equal chords are equidistant from the centre.
- ★ 5. Longer chord is closer to the centre.
- ★ 6. Find chord length when radius and distance from centre are given.

- ★ 7. Find distance from centre when radius and chord length are given.
 - ★ 8. Angle at centre is twice the angle at the circle.
 - ★ 9. Angle in a semicircle is 90° .
 - ★ 10. Equal chords subtend equal angles at the centre.
 - ★ 11. Opposite angles of a cyclic quadrilateral are supplementary.
 - ★ 12. Prove four points are concyclic using equal subtended angles.
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ANSWER KEY

Basic Concepts

1. A circle is the set of all points in a plane at a fixed distance from a fixed point called the centre.
 2. A line segment joining two points on a circle.
 3. A chord passing through the centre.
 4. **Diameter = $2 \times$ radius**
 5. A quadrilateral whose four vertices lie on the same circle.
 6. Four points lying on the same circle.
 7. **Exactly one circle.**
 8. Three collinear points cannot determine a circle.
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Theorems

9. The line joining the centre and the midpoint of a chord is **perpendicular to the chord**.
10. The perpendicular from the centre to a chord **bisects the chord**.
11. **$CM \perp AB$**

12. $AM = MB$

13. Equal chords of a circle are **equidistant from the centre**.

14. The longer chord is **closer to the centre**.

15. **Distances from the centre are equal**.

16. Diameter

17. Diameter

Angles

18. The two chords are **equal**.

19. **Equal central angles** $\rightarrow$ **equal chords**.

20. Equal chords subtend **equal angles at the centre**.

21. Central angle = $2 \times$ **angle at the circumference**.

22. 35°

23. 60°

24. The angle subtended by a diameter at any point on the circle is **90°** .

25. 90°

Chord Numericals

26. 24 cm

27. 5 cm

28. 24 cm

29. 10 cm

30. $4\sqrt{13}$ cm

31. Chord length = $2\sqrt{(r^2 - d^2)}$.

Parallel / Equal Chords

32. 7 cm

33. The chords are **equal**.

34. The **longer chord** is closer to the centre.

35. A diameter passes through the centre, so its perpendicular distance from the centre is zero; therefore it is the greatest chord.

Cyclic Quadrilaterals

36. The sum of two opposite angles of a cyclic quadrilateral is **180°**.

37. $\angle C = 105^\circ$

38. $\angle D = 70^\circ$

39.

$$2x + 10 + 3x - 20 = 180$$

$$5x - 10 = 180$$

$$x = 38$$

$$\angle P = 86^\circ$$

$$\angle R = 94^\circ$$

40. 90°

Concyclicity

41. Four points are concyclic if they all lie on one circle.

42. If a segment subtends equal angles at two points on the same side, the four points are **concyclic**.

43. **A, B, C and D are concyclic.**

44. Because all four vertices lie on the same circle.

Higher-Order Answers

45. The perpendicular bisector of every chord passes through the **centre**.

46. The altitude from A to BC passes through the **centre of the circle**.

47. Equal chords $\rightarrow$ equal distances from the centre.

48. Equal distances from centre $\rightarrow$ equal chords.

49. 90° , because the diameter subtends a semicircle of 180° at the centre and the angle at the circle is half of it.

50. Opposite angles add up to 180° .

Key Chapter 5 Results

● Diameter = $2r$

● Longer chord $\rightarrow$ closer to centre

● Equal chords $\rightarrow$ equal distances from centre

● Equal distances from centre $\rightarrow$ equal chords

● Central angle = $2 \times$ angle at circumference

● Angle in a semicircle = 90°

● Opposite angles of a cyclic quadrilateral = 180°

● Chord length = $2\sqrt{(r^2 - d^2)}$