



Class 9 Maths – Chapter 5

● End-of-Chapter Exercises – Important Questions with Answer Key

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The textbook has **11 end-of-chapter questions** in Chapter 5.

1. Chord Length

Question:

In a circle, a chord is **5 cm** away from the centre. If the radius is **13 cm**, find the length of the chord.

 **Answer:**

Half-chord:

$$\sqrt{(13^2 - 5^2)}$$

$$= \sqrt{(169 - 25)}$$

$$= \sqrt{144}$$

$$= 12 \text{ cm}$$

Therefore, chord length:

$$2 \times 12 = 24 \text{ cm}$$

★ **Answer: 24 cm**

2. ● Angle in the Circle

Question:

An arc of a circle subtends an angle of **70° at the centre**. What is the measure of the angle subtended by the arc at a point on the circle?

 Answer:

Angle at centre = **2 × angle at circumference**

Therefore:

Angle at circumference = $70^\circ/2$

= **35°**

★ **Answer: 35°**

3. Distance of Chord from Centre

Question:

The diameter of a circle is **26 cm**. A chord of length **24 cm** is drawn. Find the distance from the centre to the chord.

 Answer:

Radius:

$$r = 26/2 = 13 \text{ cm}$$

Half chord:

$$24/2 = 12 \text{ cm}$$

Using Pythagoras:

$$d^2 + 12^2 = 13^2$$

$$d^2 = 169 - 144$$

$$d^2 = 25$$

$$d = 5 \text{ cm}$$

★ **Answer: 5 cm**

4. Find Chord Length

Question:

A circle has radius **15 cm**. A chord is drawn **9 cm** from the centre. Find the length of the chord.

Answer:

Half-chord:

$$\sqrt{(15^2 - 9^2)}$$

$$= \sqrt{(225 - 81)}$$

$$= \sqrt{144}$$

$$= \mathbf{12\text{ cm}}$$

Therefore:

$$\text{Chord} = 2 \times 12$$

$$= \mathbf{24\text{ cm}}$$

 **Answer: 24 cm**

5. Perpendicular Bisector of a Chord

Question:

Prove that the perpendicular bisector of a chord passes through the centre of the circle.

Answer:

Let **AB** be a chord and **O** be the centre.

Let **M** be the midpoint of AB.

Since:

$$\mathbf{OA = OB}$$

because they are radii, and:

$$AM = MB$$

because M is the midpoint,

and:

$$OM = OM$$

by common side,

we have:

$$\triangle OMA \cong \triangle OMB \text{ by SSS.}$$

Therefore:

$$\angle OMA = \angle OMB$$

These two angles form a straight angle, so each is 90° .

Thus:

$$OM \perp AB$$

Hence, the perpendicular bisector of chord **AB** passes through **O**, the centre of the circle.

★ Answer: Proved

6. Angle in a Semicircle

Question:

The diameter of a circle is **AB**. Point C lies on the circumference. Find $\angle ACB$ and explain.

 **Answer:**

Since AB is a diameter, it subtends a **straight angle of 180° at the centre**.

Angle subtended at the circumference is half the central angle:

$$\angle ACB = 180^\circ / 2$$

$$= 90^\circ$$

★ Answer: $\angle ACB = 90^\circ$

This is the corollary stated in the textbook.

7. Cyclic Quadrilateral

Question:

ABCD is a cyclic quadrilateral.

If:

$$\angle A = 75^\circ$$

find $\angle C$.

If:

$$\angle B = 110^\circ$$

find $\angle D$.

Answer:

Opposite angles of a cyclic quadrilateral are supplementary.

Therefore:

$$\angle A + \angle C = 180^\circ$$

$$\angle C = 180^\circ - 75^\circ$$

$$= 105^\circ$$

And:

$$\angle B + \angle D = 180^\circ$$

$$\angle D = 180^\circ - 110^\circ$$

$$= 70^\circ$$

Answers:

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

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

8. Find x in a Cyclic Quadrilateral

Question:

Quadrilateral PQRS is inscribed in a circle.

$$\angle P = (2x + 10)^\circ$$

$$\angle R = (3x - 20)^\circ$$

Find x and the measures of $\angle P$ and $\angle R$.



Solution:

Opposite angles are supplementary:

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

$$5x - 10 = 180$$

$$5x = 190$$

$$x = 38$$

Now:

$$\angle P = 2(38) + 10$$

$$= 86^\circ$$

$$\angle R = 3(38) - 20$$

$$= 94^\circ$$



Answer:

$$x = 38$$

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

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

9. Find Radius from Chord

Question:

A chord has length **16 cm** and is **6 cm** from the centre. Find the radius.

Solution:

Half-chord:

$$16/2 = 8 \text{ cm}$$

Using Pythagoras:

$$r^2 = 6^2 + 8^2$$

$$= 36 + 64$$

$$= 100$$

Therefore:

$$r = 10 \text{ cm}$$

★ Answer: 10 cm

10. Brahmagupta's Formula

Question:

A cyclic quadrilateral has sides:

5, 5, 12, 12 units

Find its area.

Solution:

Semi-perimeter:

$$s = (5 + 5 + 12 + 12)/2$$

$$= 17$$

Using Brahmagupta's formula:

$$\text{Area} = \sqrt{[(s - a)(s - b)(s - c)(s - d)]}$$

$$= \sqrt{[(17-5)(17-5)(17-12)(17-12)]}$$

$$= \sqrt{(12 \times 12 \times 5 \times 5)}$$

$$= \sqrt{3600}$$

$$= 60 \text{ square units}$$

★ Answer: 60 square units

★ 11. HOTS – Circumcentre of a Cyclic Quadrilateral

Question:

Consider a cyclic quadrilateral. Without drawing its circumcircle, how can we find out whether the centre of the circumcircle lies inside or outside the quadrilateral?

✓ **Answer:**

Consider the triangles formed by the diagonals of the cyclic quadrilateral.

The position of the circumcentre can be determined by considering the **angles of the triangles**:

- If the relevant triangle is **acute-angled**, its circumcentre lies **inside**.
- If it is **obtuse-angled**, its circumcentre lies **outside**.
- If it is **right-angled**, its circumcentre lies at the **midpoint of the hypotenuse**.

★ **Key idea:** Determine the position of the circumcentre from the nature of the angles.

🔑 COMPLETE ANSWER KEY

Q.

Answer

1 24 cm

- 2 35°
- 3 5 cm
- 4 24 cm
- 5 Perpendicular bisector of chord passes through **centre**
- 6 90°
- 7 $\angle C = 105^\circ$, $\angle D = 70^\circ$
- 8 $x = 38$, $\angle P = 86^\circ$, $\angle R = 94^\circ$
- 9 10 cm
- 10 60 square units
- 11 Determine circumcentre using the **acute/obtuse/right-angle condition**

The original end-of-chapter exercise list is given in the textbook on page 114.

★ Chapter 5 Must-Remember

- 📌 Perpendicular from centre to chord $\rightarrow$ bisects chord
- 📌 Equal chords $\rightarrow$ equal distance from centre
- 📌 Longer chord $\rightarrow$ closer to centre
- 📌 Angle at centre = $2 \times$ angle at circumference
- 📌 Angle in a semicircle = 90°
- 📌 Opposite angles of cyclic quadrilateral = 180°
- 📌 Chord length = $2\sqrt{(r^2 - d^2)}$