



Class 9 Maths – Chapter 5



Exercise 5.4 – Questions with Answer Key

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Exercise Set 5.4 contains **3 questions** based on the relationship between **equal chords** and **their distances from the centre**.

1. ★ Equal Chords Are Equidistant from the Centre

Question:

Use the **Baudhāyana–Pythagoras theorem** to show why Theorem 6 is true.



Answer:

Let **AB** and **GF** be equal chords of a circle with centre **C**.

Draw perpendiculars:

$$\mathbf{CE \perp AB}$$

$$\mathbf{CH \perp GF}$$

Since a perpendicular from the centre to a chord bisects the chord:

$$\mathbf{AE = EB}$$

and

$$\mathbf{GH = HF}$$

Since:

$$\mathbf{AB = GF}$$

their halves are also equal:

$$\mathbf{AE = GH}$$

Also, **CA** and **CG** are radii of the same circle:

$$CA = CG$$

Using the Baudhāyana–Pythagoras theorem:

For $\triangle CEA$:

$$CA^2 = CE^2 + AE^2$$

For $\triangle CGH$:

$$CG^2 = CH^2 + GH^2$$

Since:

$$CA = CG$$

and

$$AE = GH$$

we get:

$$CE^2 = CH^2$$

Therefore:

$$CE = CH$$

✓ **Answer:**

Equal chords of a circle are equidistant from the centre. ★

This is the result stated as Theorem 6 in the textbook.

2. Equal Distances $\rightarrow$ Equal Chords

Question:

Consider Fig. 5.15. If $CE \perp AB$, $CH \perp GF$, and $CE = CH$, show that $AB = GF$.

 **Answer:**

Since CE and CH are perpendicular to the chords:

$$AE = EB$$

and

$$GH = HF$$

Also:

$$CA = CG$$

because both are radii.

Given:

$$CE = CH$$

Consider right triangles $\triangle CEA$ and $\triangle CHG$.

We have:

$$CA = CG$$

$$CE = CH$$

Therefore, by **RHS congruence**:

$$\triangle CEA \cong \triangle CHG$$

Hence:

$$AE = GH$$

Since the perpendiculars bisect the chords:

$$AB = 2AE$$

and

$$GF = 2GH$$

Since:

$$AE = GH$$

therefore:

$$AB = GF$$

 **Answer:**

$$AB = GF$$

This establishes the converse relationship: **chords equidistant from the centre have equal length.**

3. ★ Solve Question 2 Using Baudhāyana–Pythagoras

Question:

Solve the previous question using the **Baudhāyana–Pythagoras theorem.**



Answer:

Given:

$$CE = CH$$

Also, since both are radii:

$$CA = CG$$

By Theorem 5, the perpendicular from the centre bisects a chord:

$$AE = AB/2$$

$$GH = GF/2$$

Using Pythagoras in $\triangle CEA$:

$$CA^2 = CE^2 + AE^2$$

Using Pythagoras in $\triangle CGH$:

$$CG^2 = CH^2 + GH^2$$

Since:

$$CA = CG$$

and

$$CE = CH$$

we get:

$$AE^2 = GH^2$$

Therefore:

$$AE = GH$$

Hence:

$$AB/2 = GF/2$$

So:

$$AB = GF$$

✓ **Answer:**

$$AB = GF \star$$

The textbook specifically asks Question 3 as an alternative Pythagoras-based solution to Question 2.



ANSWER KEY

Q	Answer
1	Equal chords are equidistant from the centre
2	$AB = GF$
3	$AB = GF$

★ Remember These Two Rules

Equal chords → Equal distance from centre

Equal distance from centre → Equal chords

These are the key results developed around Exercise 5.4 in the new textbook.