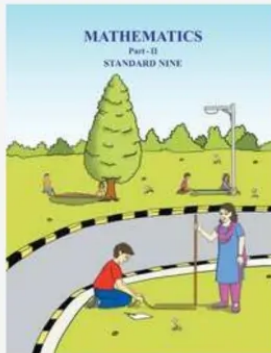


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 6.2- Circle

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 6.2
Circle



Maharashtra Board Solutions→

For any clarifications or questions you can write to info@indcareer.com

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Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 6.2- Circle

Class 9: Maths Chapter 6.2 solutions. Complete Class 9 Maths Chapter 6.2 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 6.2- Circle

Maharashtra Board 9th Maths Chapter 6.2, Class 9 Maths Chapter 6.2 solutions

Question 1.

Radius of circle is 10 cm. There are two chords of length 16 cm each. What will be the distance of these chords from the centre of the circle ?

Given: In a circle with centre O,

OR and OP are radii and RS and PQ are its congruent chords.

$PQ = RS = 16$ cm,

$OR = OP = 10$ cm

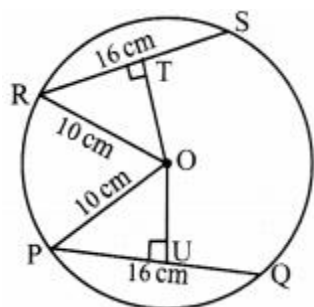
seg $OU \perp$ chord PQ, P-U-Q

seg $OT \perp$ chord RS, R-T-S

To find: Distance of chords from centre of the circle.

Solution:

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i. $PU = \frac{1}{2}(PQ)$ [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]

$$\therefore PU = \frac{1}{2} \times 16 = 8 \text{ cm} \dots (i)$$

ii. In $\triangle OUP$, $\angle OUP = 90^\circ$

$$\therefore OP^2 = OU^2 + PU^2 \text{ [Pythagoras theorem]}$$

$$\therefore 10^2 = OU^2 + 8^2 \text{ [From (i)]}$$

$$\therefore 100 = OU^2 + 64$$

$$\therefore OU^2 = 100 - 64 = 36$$

$$\therefore OU = \sqrt{36} \text{ [Taking square root on both sides]}$$

$$\therefore OU = 6 \text{ cm}$$

iii. Now, $OT = OU$ [Congruent chords of a circle are equidistant from the centre.]

$$\therefore OT = OU = 6 \text{ cm}$$

$\therefore$ The distance of the chords from the centre of the circle is 6 cm.

Question 2.

In a circle with radius 13 cm, two equal chords are at a distance of 5 cm from the centre. Find the lengths of chords.

Given: In a circle with centre O,

OA and OC are the radii and AB and CD are its congruent chords,

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$$OA = OC = 13\text{cm}$$

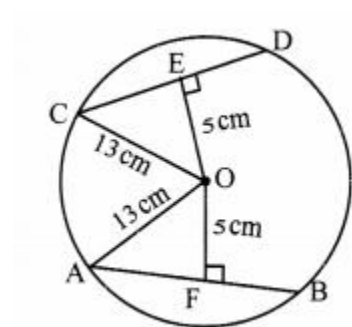
$$OE = OF = 5\text{ cm}$$

seg OE $\perp$ chord CD, C-E-D

seg OF $\perp$ chord AB. A-F-B

To find: length of the chords

Solution:



i. In $\triangle AFO$, $\angle AFO = 90^\circ$

$$\therefore AO^2 = AF^2 + FO^2 \text{ [Pythagoras theorem]}$$

$$\therefore 13^2 = AF^2 + 5^2$$

$$\therefore 169 = AF^2 + 25$$

$$\therefore AF^2 = 169 - 25$$

$$\therefore AF^2 = 144$$

$$\therefore AF = \sqrt{144} \text{ [Taking square root on both sides]}$$

$$\therefore AF = 12 \text{ cm(i)}$$

ii. Now $AF = \frac{1}{2}AB$ [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]

$$\therefore 12 = \frac{1}{2}(AB) \text{ [From (i)]}$$

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

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$\therefore CD = AB = 24 \text{ cm}$ [chord $AB \cong$ chord CD]

$\therefore$ The lengths of the two chords are 24 cm each.

Question 3.

Seg PM and seg PN are congruent chords of a circle with centre C . Show that the ray PC is the bisector of $\angle NPM$.

Given: Point C is the centre of the circle.

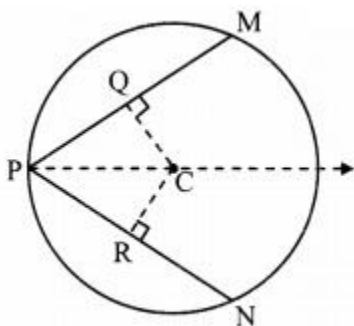
chord $PM \cong$ chord PN

To prove: Ray PC is the bisector of $\angle NPM$.

Construction: Draw seg $CR \perp$ chord PN , P - R - N

seg $CQ \perp$ chord PM , P - Q - M

Proof:



chord PM chord PN [Given]

seg $CR \perp$ chord PN

seg $CQ \perp$ chord PM [Construction]

$\therefore$ seg $CR \cong$ seg CQ (i) [Congruent chords are equidistant from the centre]

In $\triangle PRC$ and $\triangle PQC$,

$\angle PRC \cong \angle PQC$ [Each is of 90°]

seg $CR \cong$ seg CQ [From (i)]

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seg PC $\cong$ seg PC [Common side]

$\therefore \triangle PRC \cong \triangle PQC$ [Hypotenuse side test]

$\therefore \angle RPC \cong \angle QPC$ [c. a. c. t.]

$\therefore \angle NPC \cong \angle MPC$ [N- R-P, M-Q-P]

$\therefore$ Ray PC is the bisector of $\angle NPM$.

Question 1.

Prove the following two theorems for two congruent circles. (Textbook pg. no. 81)

- Congruent chords in congruent circles are equidistant from their respective centres.
- Chords of congruent circles which are equidistant from their respective centres are congruent.

Write 'Given'. 'To prove' and the proofs of these theorems.

Solution:

(i) Congruent chords in congruent circles are equidistant from their respective centres.

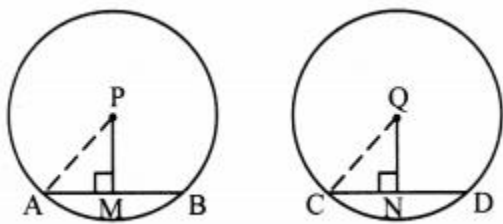
Given: Point P and point Q are the centres of congruent circles.

chord AB $\cong$ chord CD

seg PM $\perp$ chord AB, A-M-B

seg QN $\perp$ chord CD, C-N-D

To prove: PM = QN



Construction: Draw seg PA and seg QC.

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Proof:

seg $PM \perp$ chord AB, seg $QN \perp$ chord CD [Given]

$\therefore AM = \frac{1}{2}(AB)$ (i) [Perpendicular drawn from the centre of the circle to the

$\therefore CN = \frac{1}{2}(CD)$ (ii) chord bisects the chord.]

But, $AB = CD$ (iii) [Given]

$\therefore AM = CN$ [From (i), (ii) and (iii)]

i.e., seg $AM \cong$ seg CN (iv) [Segments of equal lengths]

In $\triangle PMA$ and $\triangle QNC$,

$\angle PMA \cong \angle QNC$ [Each is of 90°]

hypotenuse $PA \cong$ hypotenuse QC [Radii of congruent circles]

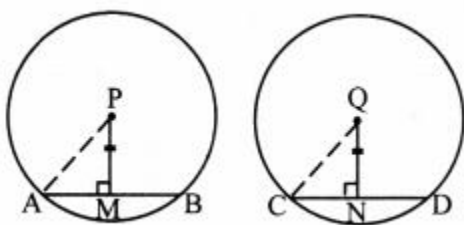
seg $AM \cong$ seg CN [From (iv)]

$\therefore \triangle PMA \cong \triangle QNC$ [Hypotenuse side test]

$\therefore$ seg $PM \cong$ seg QN [c. s. c. t.]

$\therefore PM \cong QN$ [Length of congruent segments]

(ii) Chords of congruent circles which are equidistant from their respective centres are congruent.



Given: Point P and point Q are the centres of congruent circles.

seg $PM \perp$ chord AB, A-M-B

seg $QN \perp$ chord CD, C-N-D

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$$PM = QN$$

To prove: chord $AB \cong$ chord CD

Construction: Draw seg PA and seg QC .

Proof:

In $\triangle PMA$ and $\triangle QNC$,

$$\therefore \angle PMA \cong \angle QNC \text{ [Each is of } 90^\circ]$$

$$\text{seg } PM \cong \text{seg } QN \text{ [Given]}$$

hypotenuse $PA \cong$ hypotenuse QC [Radii of the congruent circles]

$$\therefore \triangle PMA \cong \triangle QNC \text{ [Hypotenuse side test]}$$

$$\therefore \text{seg } AM \cong \text{seg } CN \text{ [c. s. c. t.]}$$

$$\therefore AM = CN \dots(i) \text{ [Length of congruent segments]}$$

Now, seg $PM \perp$ chord AB , and seg $QN \perp$ chord CD

$$\therefore AM = \frac{1}{2}(AB) \dots(ii)$$

$$\therefore CN = \frac{1}{2}(CD) \dots(iii) \text{ [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]}$$

$$\therefore AB = CD \text{ [From (i), (ii) and (iii)]}$$

$$\therefore \text{chord } AB \cong \text{chord } CD \text{ [Segments of equal lengths]}$$



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Class 9 Maths

Part 2

- Chapter 1.1- Basic Concepts in Geometry
- Chapter 1.2- Basic Concepts in Geometry
- Chapter 1.3- Basic Concepts in Geometry
- Chapter 2.1- Parallel Lines
- Chapter 2.2- Parallel Lines
- Chapter 3.1- Triangles
- Chapter 3.2- Triangles
- Chapter 3.3- Triangles
- Chapter 3.4- Triangles
- Chapter 3.5- Triangles
- Chapter 4.1- Constructions of Triangles
- Chapter 4.2- Constructions of Triangles
- Chapter 4.3- Constructions of Triangles
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- Chapter 9.3- Surface Area and Volume

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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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FAQs

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How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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