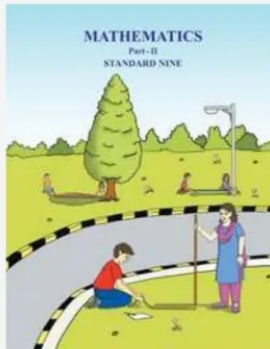


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 6.1- Circle

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 6.1
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 6.1- Circle

Class 9: Maths Chapter 6.1 solutions. Complete Class 9 Maths Chapter 6.1 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 6.1- Circle

Maharashtra Board 9th Maths Chapter 6.1, Class 9 Maths Chapter 6.1 solutions

Question 1.

Distance of chord AB from the centre of a circle is 8 cm. Length of the chord AB is 12 cm. Find the diameter of a circle.

Given: In a circle with centre O,

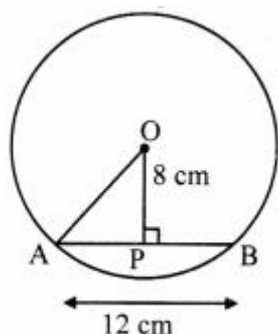
OA is radius and AB is its chord,

seg $OP \perp$ chord AB, A-P-B

AB = 12 cm, OP = 8 cm

To Find: Diameter of the circle

Solution:



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i. $AP = 12$ AB [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]

$$\therefore AP = 12 \times 12 = 6 \text{ cm} \dots(i)$$

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

$$\therefore OA^2 = OP^2 + AP^2 \text{ [Pythagoras theorem]}$$

$$= 8^2 + 6^2 \text{ [From (i)]}$$

$$= 64 + 36$$

$$\therefore OA^2 = 100$$

$$\therefore OA = 10 \text{---}\sqrt{\text{ [Taking square root on both sides]}}$$

$$= 10 \text{ cm}$$

iii. Radius (r) = 10 cm

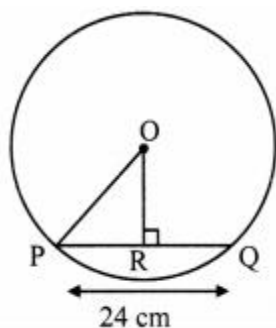
$$\therefore \text{Diameter} = 2r = 2 \times 10 = 20 \text{ cm}$$

$\therefore$ The diameter of the circle is 20 cm.

Question 2.

Diameter of a circle is 26 cm and length of a chord of the circle is 24 cm. Find the distance of the chord from the centre.

Solution:



Given: In a circle with centre O,

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PO is radius and PQ is its chord,

seg OR $\perp$ chord PQ, P-R-Q

PQ = 24 cm, diameter (d) = 26 cm

To Find: Distance of the chord from the centre (OR)

Solution:

Radius (OP) = $d/2 = 26/2 = 13$ cm(i)

$\therefore$ PR = 12 PQ [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]

= $12 \times 24 = 12$ cm(ii)

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

$\therefore OP^2 = OR^2 + PR^2$ [Pythagoras theorem]

$\therefore 13^2 = OR^2 + 12^2$ [From (i) and (ii)]

$\therefore 169 = OR^2 + 144$

$\therefore OR^2 = 169 - 144$

$\therefore OR^2 = 25$

$\therefore OR = \sqrt{25} = 5$ cm [Taking square root on both sides]

$\therefore$ The distance of the chord from the centre of the circle is 5 cm.

Question 3.

Radius of a circle is 34 cm and the distance of the chord from the centre is 30 cm, find the length of the chord.

Given: in a circle with centre A,

PA is radius and PQ is chord,

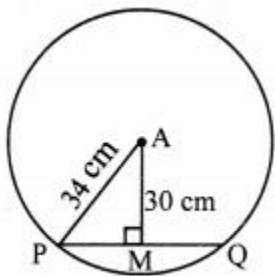
seg AM $\perp$ chord PQ, P-M-Q

AP = 34 cm, AM = 30 cm

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To Find: Length of the chord (PQ)

Solution:



I. In $\triangle AMP$, $\angle AMP = 90^\circ$

$\therefore AP^2 = AM^2 + PM^2$ [Pythagoras theorem]

$$34^2 = 30^2 + PM^2$$

$$\therefore PM^2 = 34^2 - 30^2$$

$$\therefore PM^2 = (34 - 30)(34 + 30) [a^2 - b^2 = (a - b)(a + b)]$$

$$= 4 \times 64$$

$$\therefore PM = \sqrt{4 \times 64} \dots\dots\dots (i) \text{ [Taking square root on both sides]}$$

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

ii. Now, $PM = \frac{1}{2}(PQ)$ [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]

$$16 = \frac{1}{2}(PQ) \text{ [From (i)]}$$

$$\therefore PQ = 16 \times 2$$

$$= 32\text{cm}$$

$\therefore$ The length of the chord of the circle is 32cm.

Question 4.

Radius of a circle with centre O is 41 units. Length of a chord PQ is 80 units, find the distance of the chord from the centre of the circle.

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Given: In a circle with centre O,

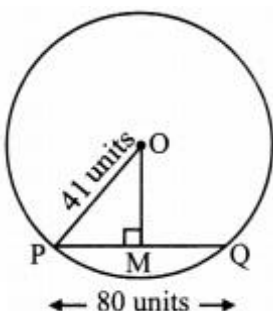
OP is radius and PQ is its chord,

seg OM $\perp$ chord PQ, P-M-Q

OP = 41 units, PQ = 80 units,

To Find: Distance of the chord from the centre of the circle(OM)

Solution:



i. $PM = MQ$ [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]

$$PM = \frac{1}{2}(PQ) = \frac{1}{2}(80) = 40 \text{ Units} \dots(i)$$

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

$$\therefore OP^2 = OM^2 + PM^2 \text{ [Pythagoras theorem]}$$

$$\therefore 41^2 = OM^2 + 40^2 \text{ [From (i)]}$$

$$\therefore OM^2 = 41^2 - 40^2$$

$$= (41 - 40)(41 + 40) [a^2 - b^2 = (a - b)(a + b)]$$

$$= (1)(81)$$

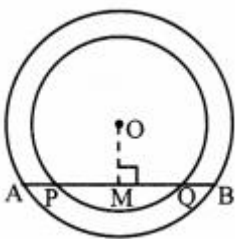
$$\therefore OM^2 = 81 \quad OM = \sqrt{81} = 9 \text{ units [Taking square root on both sides] [From (i)]}$$

$\therefore$ The distance of the chord from the centre of the circle is 9 units.

Question 5.

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In the adjoining figure, centre of two circles is O. Chord AB of bigger circle intersects the smaller circle in points P and Q. Show that $AP = BQ$.



Given: Two concentric circles having centre O.

To prove: $AP = BQ$

Construction: Draw seg $OM \perp$ chord AB, A-M-B

Solution:

Proof:

For smaller circle,

seg $OM \perp$ chord PQ [Construction, A-P-M, M-Q-B]

$\therefore PM = MQ$ (i) [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]

For bigger circle,

seg $OM \perp$ chord AB [Construction]

$\therefore AM = MB$ [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]

$\therefore AP + PM = MQ + QB$ [A-P-M, M-Q-B]

$\therefore AP + MQ = MQ + QB$ [From (i)]

$\therefore AP = BQ$

Question 6.

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Prove that, if a diameter of a circle bisects two chords of the circle then those two chords are parallel to each other.

Solution:



Given: O is the centre of the circle.

seg PQ is the diameter.

Diameter PQ bisects the chords AB and CD in points M and N respectively.

To prove: chord AB $\parallel$ chord CD.

Proof:

Diameter PQ bisects the chord AB in point M [Given]

$\therefore$ seg AM $\cong$ seg BM

$\therefore$ seg OM $\perp$ chord AB [Segment joining the centre of a circle and the midpoint of its chord is perpendicular to the chord, P-M-O, O-N-Q]

$\therefore \angle OMA = 90^\circ$ (i)

Also, diameter PQ bisects the chord CD in point N [Given]

$\therefore$ seg CN $\cong$ seg DN

seg ON $\perp$ chord CD [Segment joining the centre of a circle and the midpoint of its chord is perpendicular to the chord, P-M-O, O-N-Q]

$\therefore \angle ONC = 90^\circ$ (ii)

Now, $\angle OMA + \angle ONC = 90^\circ + 90^\circ$ [From (i) and (ii)]

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$$= 180^\circ$$

But, $\angle OMA$ and $\angle ONC$ form a pair of interior angles on lines AB and CD when seg MN is their transversal.

$\therefore$ chord AB $\parallel$ chord CD [Interior angles test]



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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
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- Chapter 9.2- Surface Area and Volume
- 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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