NCERT Solutions for Class 10 Maths Chapter 12 Ex 12.2 | Updated 2026-27

⚡ Quick Revision Box — Chapter 12 Ex 12.2

- **Area of Sector:** $(\theta)/(360) \times \pi r^2$ where θ is the central angle in degrees
- **Arc Length:** $(\theta)/(360) \times 2\pi r$
- **Area of Minor Segment:** Area of Sector − Area of Triangle = $(\theta)/(360) \times \pi r^2 - 1/2 r^2 \sin\theta$
- **Area of Major Segment:** πr^2 - Area of Minor Segment
- **Quadrant:** A sector with $\theta = 90°$; area = $1/4\pi r^2$
- **Total Questions in Ex 12.2:** 14 questions covering sector, segment, arc, and real-life applications
- **Key Values:** Use $\pi = 22/7$ unless the question specifies $\pi = 3.14$
- **Chapter Weightage:** Mensuration (including Chapter 12) typically carries 10–12 marks in CBSE Class 10 boards

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Chapter Overview — Areas Related to Circles (Class 10 Maths, 2026-27)

The **NCERT Solutions for Class 10 Maths Chapter 12 Ex 12.2** cover one of the most application-rich topics in the CBSE Class 10 syllabus — areas of sectors and segments of circles. This page provides fully worked, step-by-step solutions to all 14 questions in Exercise 12.2, updated for the **2026-27** academic year. You can also access the complete NCERT Solutions for Class 10 from our hub page.

Exercise 12.2 is part of Chapter 12 — *Areas Related to Circles* — from the NCERT official textbook for Class 10 Mathematics. The chapter builds on your knowledge of basic circle properties (circumference, area) from earlier classes and extends it to sectors, segments, and combinations of plane figures. These concepts directly connect to Chapter 11 (Constructions) and Chapter 13 (Surface Areas and Volumes).

In CBSE board exams, questions from this chapter appear as 2-mark, 3-mark, and 5-mark problems. The NCERT Solutions on this page follow the official CBSE marking scheme so your answers earn full marks. The chapter is also part of the Mensuration unit which carries significant weightage in the board paper.

Detail	Information
Class	10
Subject	Mathematics
Chapter	Chapter 12 — Areas Related to Circles
Exercise	Exercise 12.2
Textbook	NCERT Mathematics (Standard)
Number of Questions	14
Difficulty Level	Easy to Hard
Academic Year	2026-27

Key Concepts and Formulas for Exercise 12.2

What is a Sector? (सेक्टर)

A **sector** is the region enclosed between two radii of a circle and the arc between them — like a slice of pizza. The angle between the two radii is called the **central angle** (केंद्रीय कोण). A **minor sector** has a central angle less than 180°; a **major sector** has a central angle greater than 180°.

Area of a Sector:

$$\text{Area of Sector} = \frac{\theta}{360} \times \pi r^2$$

Length of Arc:

$$\text{Arc Length} = \frac{\theta}{360} \times 2\pi r$$

What is a Segment? (खंड)

A **segment** is the region between a chord and the arc it cuts off. The **minor segment** is the smaller region; the **major segment** is the larger region. To find the segment area, subtract the triangle area from the sector area.

Area of Minor Segment:

$$\text{Area of Minor Segment} = \frac{\theta}{360} \times \pi r^2 - \frac{1}{2} r^2 \sin\theta$$

Area of Major Segment:

$$\text{Area of Major Segment} = \pi r^2 - \text{Area of Minor Segment}$$

Special Cases to Remember

- A **quadrant** is a sector with θ = 90°. Its area = 1/4π r².
- A **semicircle** is a sector with θ = 180°. Its area = 1/2π r².
- When θ = 90°, the triangle in the segment is a right-angled isosceles triangle with area = 1/2 r².
- When θ = 60° and the two radii are equal, the triangle formed is **equilateral** with area = (√(3))/(4) r².

Formula Reference Table — Areas Related to Circles

Formula Name	Formula	Variables
Area of Circle	π r²	r = radius
Circumference of Circle	2π r	r = radius
Area of Sector	(θ)/(360) × π r²	θ = central angle (degrees), r = radius
Arc Length	(θ)/(360) × 2π r	θ = central angle (degrees), r = radius
Area of Minor Segment	(θ)/(360) × π r² - 1/2 r² sinθ	θ = central angle, r = radius
Area of Major Segment	π r² - Area of Minor Segment	r = radius
Area of Equilateral Triangle	(√(3))/(4) a²	a = side length

NCERT Solutions for Class 10 Maths Chapter 12 Ex 12.2 — All 14 Questions

Below are complete, step-by-step solutions to all 14 questions in Exercise 12.2. Every solution follows the CBSE marking scheme pattern so you know exactly what to write in your board exam.

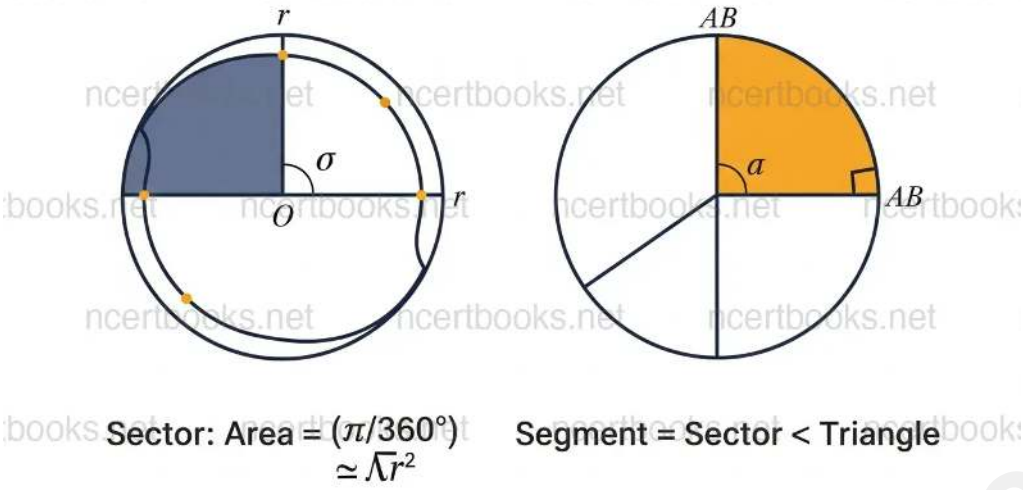

Fig 12.1: Sector (pie slice) vs Segment (between chord and arc)

Question 1

Easy

Find the area of a sector of a circle with radius 6 cm if angle of the sector is 60°.

Key Concept: Area of sector = (θ)/(360) × π r²

Step 1: Identify the given values: radius r = 6 cm, central angle θ = 60°.

Step 2: Substitute into the formula:

$$\text{Area} = 60/360 \times 22/7 \times 6^2$$

Step 3: Simplify step by step:

$$= 1/6 \times 22/7 \times 36 = 1/6 \times 792/7 = 792/42 = 132/7$$

∴ **Area of the sector = 132/7 ≈ 18.86 cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Show the substitution step clearly.

Question 2

Easy

Find the area of a quadrant of a circle whose circumference is 22 cm.

Key Concept: A quadrant is a sector with θ = 90°. First find r from the circumference.

Step 1: Use circumference formula to find radius:

$$2\pi r = 22 \Rightarrow r = (22)/(2 \times 22/7) = (22 \times 7)/(44) = 7/2 \text{ cm}$$

Step 2: Area of quadrant = $90/360 \times \pi r^2 = 1/4 \times 22/7 \times (7/2)^2$

Step 3: Calculate:

$$= 1/4 \times 22/7 \times 49/4 = 1/4 \times (22 \times 49)/(28) = 1/4 \times (1078)/(28) = (1078)/(112) = 77/8$$

∴ **Area of the quadrant = 77/8 = 9.625 cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Finding r from circumference is a key first step — don't skip it.

Question 3

Easy

The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

Key Concept: The minute hand sweeps 360° in 60 minutes, so in 5 minutes it sweeps 360/60 × 5 = 30°.

Step 1: Find the angle swept in 5 minutes:

$$\theta = (360°)/(60) \times 5 = 30°$$

Step 2: The minute hand acts as the radius: r = 14 cm.

Step 3: Area swept = Area of sector:

$$\text{Area} = 30/360 \times 22/7 \times 14^2 = 1/12 \times 22/7 \times 196$$

$$= 1/12 \times (22 \times 196)/(7) = 1/12 \times (4312)/(7) = 1/12 \times 616 = 616/12 = 154/3$$

∴ **Area swept by the minute hand in 5 minutes = 154/3 ≈ 51.33 cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. The key insight — converting time to angle — must be shown explicitly.

Question 4

Medium

A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding: (i) minor segment (ii) major segment. (Use π = 3.14)

(i) Minor Segment

Step 1: Given: r = 10 cm, θ = 90°, π = 3.14.

Step 2: Area of sector (minor):

$$= 90/360 \times 3.14 \times 10^2 = 1/4 \times 3.14 \times 100 = 78.5 \text{ cm}^2$$

Step 3: Area of right-angled triangle (with both legs = r = 10 cm, since θ = 90°):

$$= 1/2 \times 10 \times 10 = 50 \text{ cm}^2$$

Step 4: Area of minor segment:

$$= 78.5 - 50 = 28.5 \text{ cm}^2$$

∴ **Area of minor segment = 28.5 cm²**

(ii) Major Segment

Step 1: Area of full circle:

$$= \pi r^2 = 3.14 \times 100 = 314 \text{ cm}^2$$

Step 2: Area of major segment:

$$= 314 - 28.5 = 285.5 \text{ cm}^2$$

∴ **Area of major segment = 285.5 cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Always compute minor segment first, then subtract from full circle for major segment.

Question 5

Medium

In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find: (i) length of the arc. (ii) area of the sector formed by the arc. (iii) area of the segment formed by the corresponding chord.

(i) Length of the Arc

Step 1: Given r = 21 cm, θ = 60°.

Step 2: Arc length formula:

$$l = (\theta)/(360) \times 2\pi r = 60/360 \times 2 \times 22/7 \times 21 = 1/6 \times 2 \times 22/7 \times 21$$

$$= 1/6 \times 924/7 = 1/6 \times 132 = 22 \text{ cm}$$

∴ **Length of arc = 22 cm**

(ii) Area of the Sector

Step 1: Area of sector:

$$= (\theta)/(360) \times \pi r^2 = 60/360 \times 22/7 \times 21^2 = 1/6 \times 22/7 \times 441$$

$$= 1/6 \times (9702)/(7) = 1/6 \times 1386 = 231 \text{ cm}^2$$

∴ **Area of sector = 231 cm²**

(iii) Area of the Segment

Key Concept: When θ = 60° and both sides are equal to r, the triangle OAB is equilateral with side = 21 cm.

Step 1: Area of equilateral triangle with side 21 cm:

$$= (\sqrt{(3)})/(4) \times 21^2 = (\sqrt{(3)})/(4) \times 441 = (441\sqrt{(3)})/(4) \text{ cm}^2$$

Step 2: Area of segment = Area of sector − Area of triangle:

$$= 231 - (441\sqrt{(3)})/(4) = 231 - (441 \times 1.732)/(4) \approx 231 - (763.81)/(4) \approx 231 - 190.95 \approx 40.05 \text{ cm}^2$$

Why is the triangle equilateral? When the central angle is 60° and both radii are equal (r = 21 cm), all three sides of triangle OAB equal 21 cm, making it equilateral.

∴ **Area of segment = (231 - (441√(3))/(4)) ≈ 40.05 cm²**

Board Exam Note: This type of question typically appears in long answer sections of CBSE board papers. All three parts must be shown separately for full marks.

Question 6

Medium

A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the corresponding minor and major segments of the circle. (Use π = 3.14 and √(3) = 1.73)

Minor Segment

Step 1: Given r = 15 cm, θ = 60°. Since θ = 60°, the triangle is equilateral with side = 15 cm.

Step 2: Area of sector:

$$= 60/360 \times 3.14 \times 15^2 = 1/6 \times 3.14 \times 225 = (706.5)/(6) = 117.75 \text{ cm}^2$$

Step 3: Area of equilateral triangle (side = 15 cm):

$$= (\sqrt{(3)})/(4) \times 15^2 = (1.73)/(4) \times 225 = (389.25)/(4) = 97.3125 \text{ cm}^2$$

Step 4: Area of minor segment:

$$= 117.75 - 97.3125 = 20.4375 \approx 20.44 \text{ cm}^2$$

∴ **Area of minor segment ≈ 20.44 cm²**

Major Segment

Step 1: Area of full circle:

$$= 3.14 \times 15^2 = 3.14 \times 225 = 706.5 \text{ cm}^2$$

Step 2: Area of major segment:

$$= 706.5 - 20.44 = 686.06 \text{ cm}^2$$

∴ **Area of major segment ≈ 686.06 cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Use the given approximation values exactly as specified.

Question 7

Hard

A chord of a circle of radius 12 cm subtends an angle of 120° at the centre. Find the area of the corresponding segment of the circle. (Use π = 3.14 and √(3) = 1.73)

Step 1: Given r = 12 cm, θ = 120°.

Step 2: Area of sector:

$$= 120/360 \times 3.14 \times 12^2 = 1/3 \times 3.14 \times 144 = (452.16)/(3) = 150.72 \text{ cm}^2$$

Step 3: For the triangle with θ = 120°, draw perpendicular OM from centre O to chord AB. Then ∠ AOM = 60°.

In triangle OAM: OM = rcos 60° = 12 × 1/2 = 6 cm and AM = rsin 60° = 12 × (√(3))/(2) = 6√(3) cm.

So AB = 2 × AM = 12√(3) cm.

Step 4: Area of triangle OAB:

$$= 1/2 \times AB \times OM = 1/2 \times 12\sqrt{3} \times 6 = 36\sqrt{3} = 36 \times 1.73 = 62.28 \text{ cm}^2$$

Step 5: Area of segment:

$$= 150.72 - 62.28 = 88.44 \text{ cm}^2$$

∴ **Area of the segment = 88.44 cm²**

Board Exam Note: This type of question typically appears in long answer sections of CBSE board papers. The perpendicular from centre to chord method is essential for non-standard angles.

Question 8

Medium

A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find: (i) the area of that part of the field in which the horse can graze. (ii) the increase in the grazing area if the rope were 10 m long instead of 5 m. (Use π = 3.14)

(i) Grazing Area with 5 m Rope

Key Concept: The horse is at a corner of a square, so the angle available to it is 90° (the interior angle of the square). It sweeps a quarter circle of radius 5 m.

Step 1: Area grazed = area of sector with r = 5 m, θ = 90°:

$$= 90/360 \times 3.14 \times 5^2 = 1/4 \times 3.14 \times 25 = (78.5)/(4) = 19.625 \text{ m}^2$$

∴ **Grazing area = 19.625 m²**

(ii) Increase in Grazing Area with 10 m Rope

Step 1: With a 10 m rope, the horse sweeps a quarter circle of radius 10 m:

$$\text{New area} = 1/4 \times 3.14 \times 10^2 = 1/4 \times 314 = 78.5 \text{ m}^2$$

Step 2: Increase in grazing area:

$$= 78.5 - 19.625 = 58.875 \text{ m}^2$$

∴ **Increase in grazing area = 58.875 m²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. The corner angle of a square being 90° is the critical observation.

Question 9

Medium

A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors. Find: (i) the total length of the silver wire required. (ii) the area of each sector of the brooch.

(i) Total Length of Silver Wire

Step 1: Diameter = 35 mm, so radius r = 17.5 mm.

Step 2: Circumference of circle:

$$= 2\pi r = 2 \times 22/7 \times 17.5 = (2 \times 22 \times 17.5)/(7) = 770/7 = 110 \text{ mm}$$

Step 3: Length of 5 diameters = 5 × 35 = 175 mm.

Step 4: Total wire = 110 + 175 = 285 mm.

∴ **Total length of silver wire = 285 mm**

(ii) Area of Each Sector

Step 1: 5 diameters divide the circle into 10 equal sectors, so each sector has angle = (360°)/(10) = 36°.

Step 2: Area of each sector:

$$= 36/360 \times 22/7 \times (17.5)^2 = 1/10 \times 22/7 \times 306.25$$

$$= 1/10 \times (6737.5)/(7) = 1/10 \times 962.5 = 96.25 \text{ mm}^2$$

∴ **Area of each sector = 96.25 mm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Remember to add both circumference and diameter lengths for total wire.

Question 10

Easy

An umbrella has 8 ribs which are equally spaced. Assuming the umbrella to be a flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella.

Step 1: 8 equally spaced ribs divide the circle into 8 equal sectors. Angle of each sector:

$$\theta = (360°)/(8) = 45°$$

Step 2: Area of each sector (area between two consecutive ribs):

$$= 45/360 \times 22/7 \times 45^2 = 1/8 \times 22/7 \times 2025$$

$$= 1/8 \times (44550)/(7) = (44550)/(56) = (6364.28...)/(8) = (22275)/(28) \approx 795.54 \text{ cm}^2$$

Exact value: $(22275)/(28)$ cm²

∴ **Area between two consecutive ribs = $(22275)/(28) \approx 795.54$ cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Dividing 360° by the number of ribs is the key first step.

Question 11

Medium

A car has two wipers which do not overlap. Each wiper has a blade of length 25 cm sweeping through an angle of 115°. Find the total area cleaned at each sweep of the blades.

Step 1: Each wiper sweeps a sector of radius r = 25 cm and angle θ = 115°.

Step 2: Area cleaned by one wiper:

$$= 115/360 \times 22/7 \times 25^2 = 115/360 \times 22/7 \times 625$$

$$= (115 \times 22 \times 625)/(360 \times 7) = (1581250)/(2520) = (158125)/(252)$$

Step 3: Total area cleaned by two wipers (they do not overlap):

$$= 2 \times (158125)/(252) = (316250)/(252) = (158125)/(126) \approx 1254.96 \text{ cm}^2$$

Simplified exact value: $(158125)/(126)$ cm²

∴ **Total area cleaned = $(158125)/(126) \approx 1254.96$ cm²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Since the two wipers do not overlap, simply double the single wiper area.

Question 12

Easy

To warn ships for underwater rocks, a lighthouse spreads a red coloured light over a sector of angle 80° to a distance of 16.5 km. Find the area of the sea over which the ships are warned. (Use π = 3.14)

Step 1: Given θ = 80°, r = 16.5 km, π = 3.14.

Step 2: Area of the sector (sea area warned):

$$= 80/360 \times 3.14 \times (16.5)^2$$

$$= 2/9 \times 3.14 \times 272.25$$

$$= 2/9 \times 854.865 = (1709.73)/(9) = 189.97 \text{ km}^2$$

∴ **Area of sea over which ships are warned ≈ 189.97 km²**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Note that the unit here is km², not cm².

Question 13

Hard

A round table cover has six equal designs as shown in the figure. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of ₹0.35 per cm². (Use √(3) = 1.7)

Key Concept: Six equal designs means the circle is divided into 6 equal sectors. Each design is the segment of one sector. The central angle for each sector = (360°)/(6) = 60°.

Step 1: Area of one sector (r = 28 cm, θ = 60°):

$$= 60/360 \times 22/7 \times 28^2 = 1/6 \times 22/7 \times 784 = 1/6 \times (17248)/(7) = 1/6 \times 2464 = (2464)/(6) = (1232)/(3) \text{ cm}^2$$

Step 2: Since θ = 60°, the triangle formed is equilateral with side = 28 cm. Area of equilateral triangle:

$$= (\sqrt{(3)})/(4) \times 28^2 = 1.7/4 \times 784 = (1332.8)/(4) = 333.2 \text{ cm}^2$$

Step 3: Area of one segment (one design):

$$= (1232)/(3) - 333.2 = 410.67 - 333.2 = 77.47 \text{ cm}^2$$

Step 4: Total area of 6 designs:

$$= 6 \times 77.47 = 464.82 \text{ cm}^2$$

Step 5: Cost of making designs:

$$= 464.82 \times 0.35 = ₹162.69$$

∴ **Cost of making the designs ≈ ₹162.69**

Board Exam Note: This type of question typically appears in long answer sections of CBSE board papers. Show the cost calculation as a final separate step.

Question 14

Easy

Tick the correct answer in the following: Area of a sector of angle p (in degrees) of a circle with radius R is:

(A) $p/180 \times 2\pi R$ (B) $p/180 \times \pi R^2$ (C) $p/360 \times 2\pi R$ (D) $p/720 \times 2\pi R^2$

Key Concept: The standard formula for area of a sector is $(\theta)/(360) \times \pi R^2$.

Analysis of Option (D):

$$p/720 \times 2\pi R^2 = (2p\pi R^2)/(720) = (p\pi R^2)/(360) = p/360 \times \pi R^2$$

This matches the standard formula exactly.

Why other options are wrong:

- Option (A) and (C) give arc length (with $2\pi R$), not area.
- Option (B) uses 180 instead of 360 in the denominator, which is incorrect.

∴ **Correct Answer: (D) $p/720 \times 2\pi R^2$**

Board Exam Note: This type of question typically appears as a 1-mark MCQ in CBSE board papers. Remember that $p/720 \times 2\pi R^2 = p/360 \times \pi R^2$ — they are equivalent.

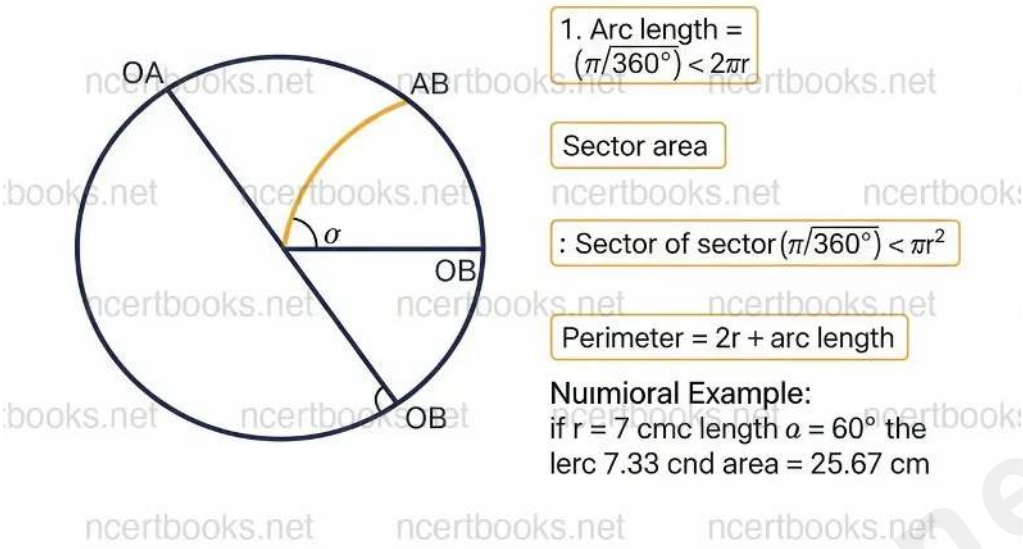

Fig 12.3: Arc length and sector area formulas for angle θ at center

Solved Examples Beyond NCERT — Areas Related to Circles

Extra Example 1 — Sector with Perimeter Given

Medium

The perimeter of a sector of a circle with radius 7 cm is 30 cm. Find the area of the sector.

Step 1: Perimeter of sector = 2r + arc length. So arc length = 30 - 2 × 7 = 16 cm.

Step 2: Area of sector = 1/2 × r × l = 1/2 × 7 × 16 = 56 cm².

∴ **Area of sector = 56 cm²**

Extra Example 2 — Segment Area with 90° Angle

Medium

Find the area of the minor segment of a circle of radius 14 cm, when the angle of the corresponding sector is 90°. (Use π = 22/7)

Step 1: Area of sector: 90/360 × 22/7 × 196 = 1/4 × (22 × 196)/(7) = 1/4 × 616 = 154 cm².

Step 2: Area of right-angled triangle: 1/2 × 14 × 14 = 98 cm².

Step 3: Area of segment = 154 - 98 = 56 cm².

∴ **Area of minor segment = 56 cm²**

Extra Example 3 — Real-Life Application (Sprinkler)

Hard

A sprinkler covers a sector of angle 120° up to a distance of 6 m. Find the area irrigated. (Use π = 3.14)

Step 1: Area = 120/360 × 3.14 × 6² = 1/3 × 3.14 × 36 = (113.04)/(3) = 37.68 m².

∴ **Area irrigated = 37.68 m²**

Important Questions for CBSE Board Exam — Chapter 12 Areas Related to Circles

1-Mark Questions

1. **Q:** What is the formula for the area of a sector? **A:** (θ)/(360) × π r²
2. **Q:** What fraction of a circle's area is a quadrant? **A:** 1/4
3. **Q:** If a sector has angle 180°, what shape does it form? **A:** A semicircle.

3-Mark Questions

1. **Q:** Find the area of the sector of a circle with radius 4 cm and angle 90°. Show full working.
   A: Area = 90/360 × 22/7 × 16 = 1/4 × 352/7 = 88/7 ≈ 12.57 cm².
2. **Q:** A chord of a circle of radius 7 cm subtends 60° at the centre. Find the area of the minor segment.
   A: Sector area = 60/360 × 22/7 × 49 = 1/6 × 154 = 77/3 cm². Triangle area (equilateral, side 7) = (√(3))/(4) × 49 ≈ 21.22 cm². Segment ≈ 77/3 - 21.22 ≈ 25.67 - 21.22 = 4.45 cm².

5-Mark Questions

1. **Q:** In a circle of radius 21 cm, a chord subtends 120° at the centre. Find the area of (i) the minor sector, (ii) the minor segment, (iii) the major segment. (Use π = 22/7, √(3) = 1.73)
   A: (i) Minor sector = 120/360 × 22/7 × 441 = 462 cm². (ii) Triangle area = 1/2 × 21² × sin 120° = 1/2 × 441 × (√(3))/(2) = (441 × 1.73)/(4) ≈ 190.67 cm². Minor segment ≈ 462 - 190.67 = 271.33 cm². (iii) Circle area = 22/7 × 441 = 1386 cm². Major segment = 1386 - 271.33 = 1114.67 cm².

Common Mistakes Students Make — Chapter 12 Ex 12.2

Mistake 1: Using the wrong value of π.

Why it's wrong: Some questions specify π = 3.14 while others expect π = 22/7. Using the wrong value loses marks.

Correct approach: Always read the question carefully. Use π = 22/7 by default unless the question specifies π = 3.14.

Mistake 2: Forgetting to subtract the triangle area when finding segment area.

Why it's wrong: Area of segment ≠ Area of sector. Students often write sector area as the final answer for segment questions.

Correct approach: Area of segment = Area of sector − Area of triangle formed by the chord and the two radii.

Mistake 3: Not identifying the triangle type correctly for θ = 60°.

Why it's wrong: When θ = 60° and both sides are equal to r, the triangle is equilateral — students sometimes treat it as a general triangle and use a wrong formula.

Correct approach: For θ = 60°, use area of equilateral triangle = $(\sqrt{3})/(4)\ r^2$.

Mistake 4: Wrong angle for the horse/grazing problems.

Why it's wrong: Students use 360° or 180° instead of 90° for the corner angle of a square.

Correct approach: The interior angle of a square is 90°. The horse at a corner can only graze a quarter circle (90° sector).

Mistake 5: Forgetting to multiply by 2 for two wipers in Question 11.

Why it's wrong: The question asks for total area cleaned by both wipers, not just one.

Correct approach: Since the wipers do not overlap, total area = 2 × area of one wiper's sector.

Exam Tips for 2026-27 CBSE Board — Chapter 12 Areas Related to Circles

- **Show all steps:** In the 2026-27 CBSE marking scheme, method marks are awarded for each step. Even if your final answer is slightly off due to rounding, you earn marks for correct working.

- **Formula first:** Always write the formula before substituting values. CBSE examiners award 1 mark specifically for writing the correct formula.
- **Units matter:** Write cm² for area, cm for length. Missing units can cost you half a mark in board exams.
- **MCQ strategy:** For Question 14-type MCQs, verify your answer by simplifying all options to the standard form $(\theta)/(360) \times \pi R^2$.
- **Segment vs Sector:** Draw a quick sketch to identify whether the shaded region is a sector or segment. This avoids the most common error in this chapter.
- **Chapter weightage:** Mensuration (Chapters 12 and 13 combined) typically carries 10–12 marks in the CBSE Class 10 board paper. Mastering Exercise 12.2 gives you a strong advantage.
- **Last-minute checklist:** Memorise the 7 formulas in the reference table above. Practise Questions 5, 7, and 13 — they are the most frequently asked in past board papers.

Frequently Asked Questions — NCERT Solutions Class 10 Maths Chapter 12 Ex 12.2

How do you find the area of a sector of a circle for Class 10 Maths?

The area of a sector with radius r and central angle θ (in degrees) is given by $(\theta)/(360) \times \pi r^2$. For example, in Question 1, radius = 6 cm and angle = 60°, giving area = 60/360 × 22/7 × 36 = 132/7 ≈ 18.86 cm². Always write the formula first in board exams to earn the formula mark.

What is the difference between a sector and a segment of a circle?

A sector (सेक्टर) is the pizza-slice shaped region between two radii and an arc. A segment (खंड) is the region between a chord and the arc it cuts. The key difference: Area of segment = Area of sector − Area of the triangle formed by the chord and the two radii. This distinction is tested in almost every board exam paper.

How many questions are in Exercise 12.2 of Class 10 Maths and are they all important?

Exercise 12.2 has 14 questions. All questions are important for the 2026-27 CBSE board exam. Questions 4, 5, 6, 7, and 13 are especially high-value as they involve segment area calculations — a topic that appears almost every year in board papers. Question 14 is an MCQ testing formula recall. Practise all 14 questions using the step-by-step solutions on this page.

What is the formula for the area of a minor segment of a circle?

The area of the minor segment = $(\theta)/(360) \times \pi r^2 - 1/2\, r^2 \sin\theta$, where θ is the central angle in degrees and r is the radius. For special cases: when $\theta = 90°$, the triangle area is $1/2r^2$; when $\theta = 60°$, the triangle is equilateral with area $(\sqrt{(3)})/(4)r^2$. The area of the major segment = πr^2 − area of minor segment.

Is Chapter 12 Exercise 12.2 included in the 2026-27 CBSE Class 10 syllabus?

Yes, Exercise 12.2 of Chapter 12 — Areas Related to Circles — is fully included in the current 2026-27 CBSE Class 10 syllabus. The chapter covers sectors, segments, and their areas, which are core topics in the Mensuration unit. Students preparing for the 2026-27 board exam must complete all 14 questions in this exercise. You can verify the current syllabus on the CBSE Academic website.

How do I download the NCERT Solutions for Class 10 Maths Chapter 12 Ex 12.2 PDF?

You can access the complete NCERT Solutions for Class 10 Maths Chapter 12 Ex 12.2 on this page — all 14 questions are solved with step-by-step working. To save as PDF, use your browser's Print → Save as PDF option. The solutions are updated for the 2026-27 CBSE syllabus and follow the official NCERT marking scheme. You can also access all Class 10 solutions from our NCERT Solutions Class 10 hub.
