

CLASS 10

MATHS

NCERT SOLUTIONS

NCERT Solutions for Class 10 Maths Chapter 11: Areas Related to Circles (2026-27) – Free PDF Download

Class 10 Maths Chapter 11, Areas Related to Circles, has a single exercise (Exercise 11.1) in the current 2023-rationalised, 2026-27 session syllabus, combining sector/segment area and combination-of-figures problems. Below are original, step-by-step solutions to all 14 questions.

Contents

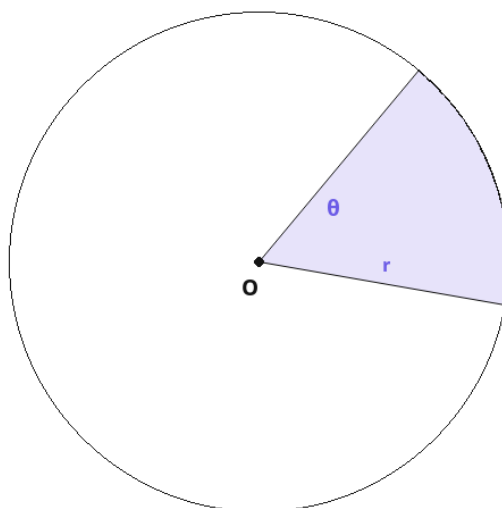
Why This Chapter Matters for Boards

Exercise 11.1 Solutions

CBSE Exam Weightage

Class 10 Mathematics Chapter 11 – Notes and Extra Questions

Class 10 Maths Chapter 11, **Areas Related to Circles**, has a single exercise (Exercise 11.1) in the current 2023-rationalised, 2026-27 session syllabus, combining sector/segment area and combination-of-figures problems. Below are original, step-by-step solutions to all 14 questions.



Sector area = $(\theta/360) \times \pi r^2$; Arc length = $(\theta/360) \times 2\pi r$, where θ is the angle at the centre.

Reference figure — sector of a circle (angle θ , radius r)

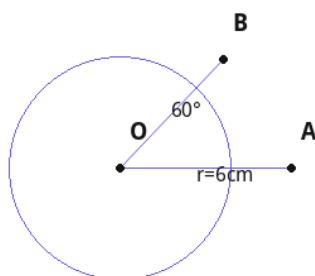
Why This Chapter Matters for Boards

Areas Related to Circles is a high-weightage Mensuration chapter in the CBSE Class 10 Maths board exam. Questions here test application of the sector and segment area formulas to real-life contexts (clocks, wipers, brooches, umbrellas, tables) and frequently appear as 3-5 mark application-based questions.

Exercise 11.1 Solutions

Q1. Find the area of a sector of a circle with radius 6 cm if angle of the sector is 60° .

Area = $(\theta/360) \times \pi r^2 = (60/360) \times (22/7) \times 6^2 = (1/6) \times (22/7) \times 36 = 132/7 = \mathbf{18.86 \text{ cm}^2}$ (approx.)

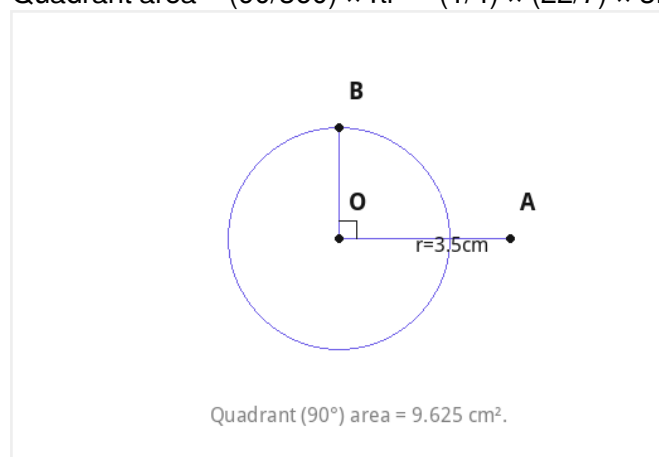


Sector area = $(60/360) \times \pi r^2 \approx 18.86 \text{ cm}^2$.

Q2. Find the area of a quadrant of a circle whose circumference is 22 cm.

$2\pi r = 22 \Rightarrow r = 22 \times 7 / (2 \times 22) = 3.5 \text{ cm}$.

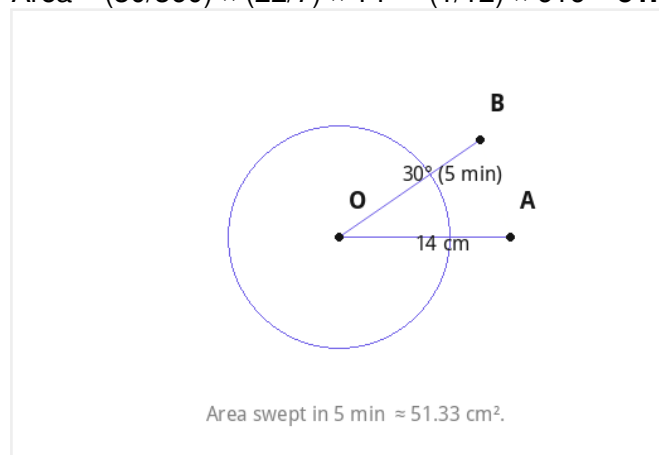
$$\text{Quadrant area} = (90/360) \times \pi r^2 = (1/4) \times (22/7) \times 3.5^2 = (1/4) \times 38.5 = \mathbf{9.625 \text{ cm}^2}$$



Q3. The length of the minute hand of a clock is 14 cm. Find the area swept by it in 5 minutes.

Angle swept in 5 min = $(5/60) \times 360^\circ = 30^\circ$.

$$\text{Area} = (30/360) \times (22/7) \times 14^2 = (1/12) \times 616 = \mathbf{51.33 \text{ cm}^2} \text{ (approx.)}$$

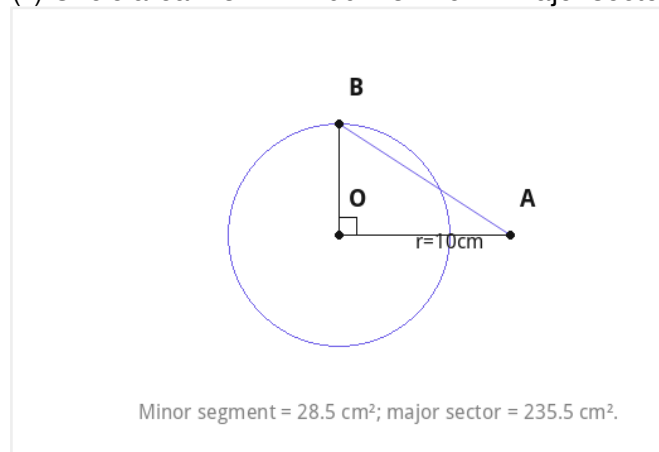


Q4. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of (i) minor segment (ii) major sector (use $\pi = 3.14$).

(i) Sector(90°) area = $(1/4) \times 3.14 \times 100 = 78.5 \text{ cm}^2$. Triangle area (right angle, legs = r) = $(1/2) \times 10 \times 10 = 50 \text{ cm}^2$.

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

$$\text{(ii) Circle area} = 3.14 \times 100 = 314 \text{ cm}^2. \text{ Major sector} = 314 - 78.5 = \mathbf{235.5 \text{ cm}^2}$$

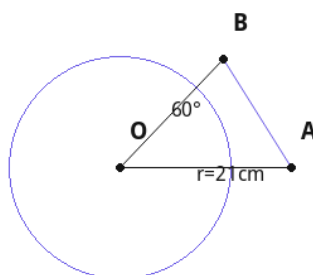


Q5. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find (i) length of arc (ii) area of sector (iii) area of segment.

(i) Arc length = $(60/360) \times 2 \times (22/7) \times 21 = (1/6) \times 132 = \mathbf{22 \text{ cm}}$

(ii) Sector area = $(60/360) \times (22/7) \times 441 = (1/6) \times 1386 = \mathbf{231 \text{ cm}^2}$

(iii) Triangle area (equilateral since angle = 60° , two sides = r) = $(\sqrt{3}/4) \times 21^2 \approx 190.87 \text{ cm}^2$. Segment = 231



Arc=22cm, sector=231cm², segment ≈40.13cm².

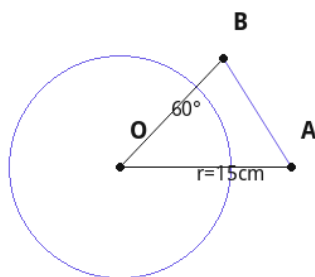
– 190.87 = **40.13 cm²** (approx.)

Q6. A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the minor and major segments (use $\pi = 3.14$, $\sqrt{3} = 1.73$).

Sector(60°) = $(1/6) \times 3.14 \times 225 = 117.75 \text{ cm}^2$. Triangle (equilateral) = $(1.73/4) \times 225 = 97.31 \text{ cm}^2$.

Minor segment = $117.75 - 97.31 = \mathbf{20.44 \text{ cm}^2}$

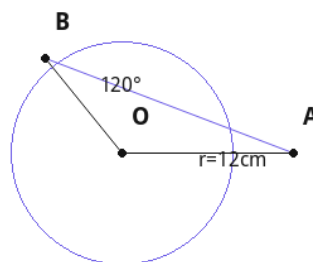
Circle area = $3.14 \times 225 = 706.5 \text{ cm}^2$. Major segment = $706.5 - 20.44 = \mathbf{686.06 \text{ cm}^2}$



Minor segment ≈20.44cm²; major segment ≈686.06cm².

Q7. A chord of a circle of radius 12 cm subtends an angle of 120° at the centre. Find the area of the corresponding segment (use $\pi = 3.14$, $\sqrt{3} = 1.73$).

Sector(120°) = $(1/3) \times 3.14 \times 144 = 150.72 \text{ cm}^2$. Triangle area = $(1/2)r^2\sin 120^\circ = (1/2) \times 144 \times 0.866 = 62.35 \text{ cm}^2$.



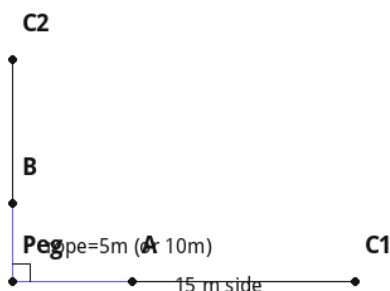
Segment area $\approx 88.37 \text{ cm}^2$.

$$\text{Segment} = 150.72 - 62.35 = \mathbf{88.37 \text{ cm}^2}$$

Q8. A horse is tied to a peg at one corner of a square field of side 15 m by a 5 m rope. Find (i) the grazing area, (ii) the increase in grazing area if the rope is 10 m long (use $\pi = 3.14$). Since the peg is at a corner of a square, the horse can graze a quarter circle (90°).

(i) Area = $(1/4) \times 3.14 \times 5^2 = \mathbf{19.625 \text{ m}^2}$

(ii) With 10 m rope: $(1/4) \times 3.14 \times 10^2 = 78.5 \text{ m}^2$. Increase = $78.5 - 19.625 = \mathbf{58.875 \text{ m}^2}$



Quarter-circle grazing area = 19.625 m^2 (5m) / 78.5 m^2 (10m).

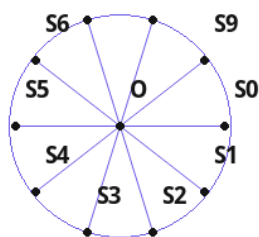
Q9. A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used to make 5 diameters which divide the circle into 10 equal sectors. Find (i) total length of silver wire, (ii) area of each sector.

Radius = 17.5 mm. Circumference = $\pi d = (22/7) \times 35 = 110 \text{ mm}$. 5 diameters = $5 \times 35 = 175 \text{ mm}$.

(i) Total wire = $110 + 175 = \mathbf{285 \text{ mm}}$

(ii) Each sector area = $\pi r^2 / 10 = [(22/7) \times 17.5^2] / 10 = 962.5 / 10 = \mathbf{96.25 \text{ mm}^2}$

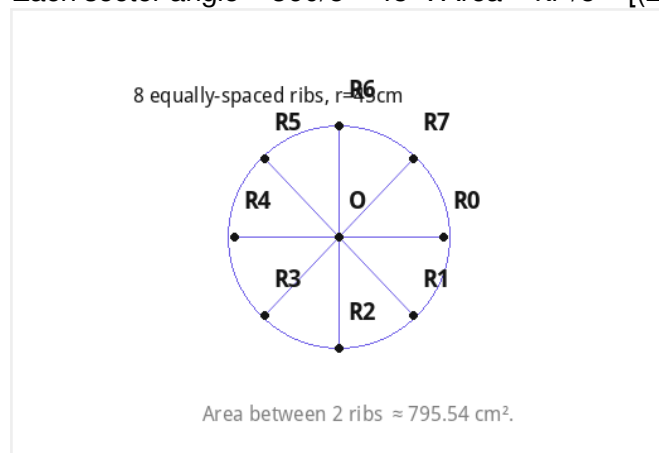
d=35mm, 5 diameters $\rightarrow 10$ equal sectors



Wire = 285 mm; each sector = 96.25 mm^2 .

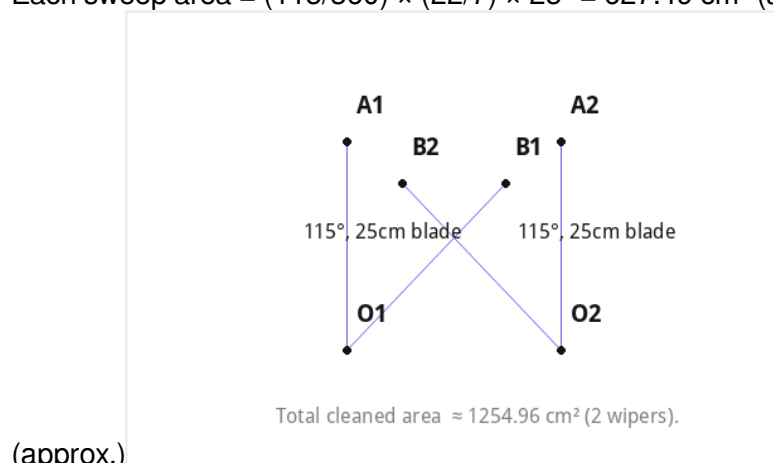
Q10. An umbrella has 8 ribs equally spaced, with radius 45 cm. Find the area between two consecutive ribs.

Each sector angle = $360/8 = 45^\circ$. Area = $\pi r^2/8 = [(22/7) \times 45^2]/8 = 6364.29/8 = \mathbf{795.54 \text{ cm}^2}$ (approx.)



Q11. A car has two wipers which do not overlap. Each wiper has a blade of length 25 cm sweeping through 115° . Find the total area cleaned.

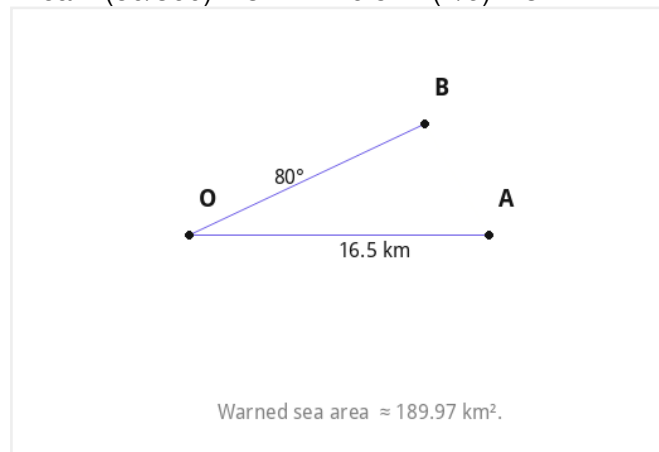
Each sweep area = $(115/360) \times (22/7) \times 25^2 = 627.49 \text{ cm}^2$ (approx). Total for 2 wipers = $\mathbf{1254.96 \text{ cm}^2}$



(approx.)

Q12. A ship is spreading a warning red-light signal through a sector of angle 80° over the sea, to a distance of 16.5 km. Find the area of the sea over which ships are warned (use $\pi = 3.14$).

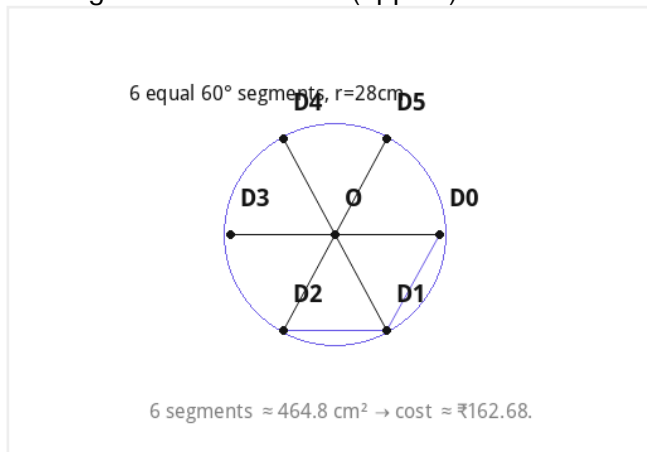
Area = $(80/360) \times 3.14 \times 16.5^2 = (2/9) \times 3.14 \times 272.25 = \mathbf{189.97 \text{ km}^2}$ (approx.)



Q13. A round table cover has six equal designs made by dividing it into 6 equal segments, radius 28 cm. Find the cost of making the designs at Rs 0.35 per cm^2 (use $\sqrt{3} = 1.7$).

Each design corresponds to a 60° segment. Sector = $(1/6) \times (22/7) \times 784 = 410.67 \text{ cm}^2$. Triangle (equilateral) = $(1.7/4) \times 784 = 333.2 \text{ cm}^2$.

One segment = $410.67 - 333.2 = 77.47 \text{ cm}^2$. Six segments = 464.8 cm^2 (approx). Cost = $464.8 \times 0.35 =$



₹162.68 (approx, using $\sqrt{3}=1.7$ as specified).

Q14. Tick the correct answer: 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) $P/720 \times 2\pi R^2$

Since sector area = $(P/360) \times \pi R^2 = (P/720) \times 2\pi R^2$, the answer is **(D)**.

CBSE Exam Weightage

This chapter falls under **Unit VI: Mensuration** in the CBSE Class 10 Maths board exam syllabus. This unit typically carries around **10 marks (12.5%)** of the 80-mark theory paper, based on CBSE's published unit-wise weightage (Question Paper Design). CBSE sets weightage at the unit level rather than chapter-by-chapter, so the exact share from this specific chapter can vary a little between years and sample papers.

Class 10 Mathematics Chapter 11 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the [Class 10 Mathematics Chapter 11 Extra Questions](#) and [Class 10 Mathematics Chapter 11 Revision Notes](#) for quick revision and extra practice.