CBSE CLASS 10 MATHS · CHAPTER 11 · 2026-27

Areas Related to Circles Class 10 Important Questions

10 questions · 27 marks · no calculator · step-marked answers

Name _____ Date _____ Score / 27

- Original questions in the board paper's question types, from 1-mark MCQs to a case study. Try every question before you look at the answers.
- No calculator: as in the CBSE board exam, everything works by hand.
- Worked answers with step marks for 5 questions start after the questions. The other 5 open free on the chapter page with a free account (no card): the link is next to each one.
- Online, with more practice: cbsemathrevision.com/class-10/areas-related-to-circles

Section A · Multiple choice and assertion–reason (1 mark each)

1. 1 mark · Area of a sector

The area of a sector of angle $60°$ in a circle of radius 6 cm is

(a) $12\pi \text{ cm}^2$ (b) $3\pi \text{ cm}^2$

(c) $6\pi \text{ cm}^2$ (d) $36\pi \text{ cm}^2$

2. 1 mark · Length of an arc

The length of the arc that subtends $90°$ at the centre of a circle of radius 14 cm is (take $\pi = \frac{22}{7}$)

(a) 22 cm (b) 44 cm

(c) 11 cm (d) 154 cm

3. 1 mark · Area of a sector

In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

Assertion (A): A circle whose circumference is 44 cm has area 154 cm^2 (take $\pi = \frac{22}{7}$).

Reason (R): The area of a sector of angle θ in a circle of radius r is $\frac{\theta}{360°} \times \pi r^2$.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

Section B · Short answer (2 marks each)

4. **2 marks · Area of a sector**

Find the area of a sector of angle $120°$ in a circle of radius 21 cm. (Take $\pi = \frac{22}{7}$.)

5. **2 marks · Length of an arc**

The bob of a pendulum swings through an angle of $60°$ and moves along an arc 11 cm long. Find the length of the pendulum. (Take $\pi = \frac{22}{7}$.)

Section C · Short answer (3 marks each)

6. **3 marks · Area of a segment**

A chord of a circle of radius 6 cm subtends an angle of $60°$ at the centre. Find the area of the minor segment, leaving π and surds in your answer.

7. 3 marks · Area of a sector

A goat is tied to a peg at one corner of a rectangular field 30 m by 25 m with a rope 14 m long. Find the area of the field the goat can graze. How much more area could it graze if the rope were 21 m long? (Take $\pi = \frac{22}{7}$.)

Section D · Long answer (5 marks each)

8. 5 marks · Area of a sector

A car's wiper arm is 35 cm long. Its rubber blade covers the part of the arm from 14 cm to 35 cm from the pivot, and the arm turns through $120°$. (a) Find the area of glass cleaned in one sweep. (b) Find the length of the arc traced by the tip of the blade. (Take $\pi = \frac{22}{7}$.)

9. **5 marks · Area of a segment**

The glass at the top of an arched window is the minor segment cut from a circle of radius 60 cm by a chord AB that subtends $120°$ at the centre O. Find (a) the length of the arc AB, (b) the area of the sector OAB, (c) the area of the glass, and (d) the length of edging needed for the arc and the chord together. Leave π and surds in your answers.

Section E · Case study (4 marks)

10. **4 marks · Area of a sector**

Fan-shaped stage. An open-air stage is shaped as a sector of a circle of radius 21 m with an angle of $60°$ at the centre. (Take $\pi = \dfrac{22}{7}$.)

i. Find the length of the curved front edge of the stage. *[1 mark]*

ii. Find the floor area of the stage. *[1 mark]*

iii. The stage is widened so that its angle becomes $90°$, with the same radius. How much floor area is added? *[2 marks]*

Answers and worked solutions

Question 1 — 1 mark

$\frac{60}{360} \times \pi \times 6^2 = 6\pi \text{ cm}^2$ A1

Correct option: (c) $6\pi \text{ cm}^2$

Question 2 — 1 mark

Worked answer: free with a free account (no card) on the chapter page: cbsemathrevision.com/class-10/areas-related-to-circles#iq-2

Question 3 — 1 mark

Worked answer: free with a free account (no card) on the chapter page: cbsemathrevision.com/class-10/areas-related-to-circles#iq-3

Question 4 — 2 marks

Answer: 462 cm^2

Area $= \frac{120}{360} \times \frac{22}{7} \times 21 \times 21$ M1

$= \frac{1}{3} \times 1386 = 462 \text{ cm}^2$ A1

Question 5 — 2 marks

Worked answer: free with a free account (no card) on the chapter page: cbsemathrevision.com/class-10/areas-related-to-circles#iq-5

Question 6 — 3 marks

Answer: $(6\pi - 9\sqrt{3}) \text{ cm}^2$

Area of the sector $= \frac{60}{360} \times \pi \times 36 = 6\pi \text{ cm}^2$ A1

The triangle formed by the chord and the radii is equilateral with side 6 cm: area

$= \frac{\sqrt{3}}{4} \times 36 = 9\sqrt{3} \text{ cm}^2$ M1

Minor segment $= (6\pi - 9\sqrt{3}) \text{ cm}^2$ A1

Question 7 — 3 marks

Worked answer: free with a free account (no card) on the chapter page: cbsemathrevision.com/class-10/areas-related-to-circles#iq-7

Question 8 — 5 marks

Answer: 1078 cm^2; $\frac{220}{3}$ cm

(a) The cleaned region is the sector of radius 35 cm minus the sector of radius 14 cm, both of angle $120°$ M1

Larger sector $= \frac{1}{3} \times \frac{22}{7} \times 1225 = \frac{3850}{3} \text{ cm}^2$ A1

Smaller sector $= \frac{1}{3} \times \frac{22}{7} \times 196 = \frac{616}{3} \text{ cm}^2$ A1

Area cleaned

$= \frac{3850 - 616}{3} = \frac{3234}{3} = 1078 \text{ cm}^2$ A1

(b) Arc $= \frac{1}{3} \times 2 \times \frac{22}{7} \times 35 = \frac{220}{3} \approx 73.3$ cm A1

Question 9 — 5 marks

Worked answer: free with a free account (no card) on the chapter page: cbsemathrevision.com/class-10/areas-related-to-circles#iq-9

Question 10 — 4 marks

i. $\frac{60}{360} \times 2 \times \frac{22}{7} \times 21 = 22 \, m$ A1

ii. $\frac{60}{360} \times \frac{22}{7} \times 21^2 = 231 \text{ m}^2$ A1

iii. The added part is a sector of angle $30°$:

$\frac{30}{360} \times \frac{22}{7} \times 441$ M1

$= 115.5 \text{ m}^2$ A1

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