SmartKalike

CBSE Class 10 · Maths

Areas Related to Circles

10 most probable questions for Boards 2027

Q1. 1 mark · Very short answer

Write the formula for the length of an arc subtending an angle θ degrees at the centre of a circle of radius r.

Answer

The length of an arc is $L = (\theta/360°) \times 2\pi r$, where θ is measured in degrees and r is the circle's radius.

Q2. 2 marks · Short answer

State the formula for the area of a sector of a circle of radius r and central angle θ degrees.

Answer

The area of a sector of radius r and central angle θ° is $A = (\theta/360°) \times \pi r^2$. This follows because the full circle, measuring 360°, has area πr^2.

Q3. 2.5 marks · Medium answer

What part of a circular region is called a sector? Describe the boundaries that enclose it.

Answer

1. A sector is the portion of a circular region enclosed by two radii and the corresponding arc. The two radii meet at the centre and form the sector's angle.
2. Thus, the curved boundary is the corresponding arc, while the straight boundaries are the two radii; together they enclose the required part of the circle.

Q4. 5 marks · Long answer

Explain how to obtain the area of a minor segment from the area of its corresponding sector. State the relationship using the triangle formed by the two radii and the chord.

Answer

The minor segment is the part of the circular region bounded by a chord and its corresponding minor arc.

1. The corresponding sector is bounded by the two radii and the same arc; its central angle is θ.
2. Its area is $A_{sector} = (\theta/360°) \times \pi r^2$, where r is the radius and θ is measured in degrees.
3. The chord joins the endpoints of the radii, forming triangle OAB with the two radii as sides.
4. Find the area of triangle OAB from the given measurements, then subtract that area from the sector area.

Therefore, the area of the minor segment equals the area of the corresponding sector minus the area of triangle OAB.

Q5. 10 marks · Very long answer

A chord of a circle of radius 14 cm subtends an angle of 60° at the centre. Find the areas of the minor and major segments. In your working, identify the region enclosed by the chord and its corresponding arc, use the usual meaning of 'segment', and determine the angle of the major sector.

Answer

Identification: The required regions are segments, each enclosed between the chord and its corresponding arc; "segment" means the minor segment unless stated otherwise.
Given: Radius r = 14 cm, minor central angle θ = 60°.
Major-sector angle: 360° − 60° = 300°.
Formula: Area of a sector = (θ/360°) × πr².
Formula: Area of a segment = area of its corresponding sector − area of the triangle formed by the two radii and chord.
Substitution: Use π = 22/7; the triangle formed by the radii and chord is equilateral because all its sides are 14 cm.
Minor-sector area = (60°/360°) × (22/7) × 14².
Minor-sector area = (1/6) × 616 = 308/3 cm² ≈ 102.67 cm².
Triangle area = (√3/4) × 14² = 49√3 cm² ≈ 84.87 cm², using √3 ≈ 1.732.
Minor-segment area = 308/3 − 49√3 ≈ 102.67 − 84.87 = 17.80 cm².
Major-segment area = area of circle − minor-segment area.
Area of circle = (22/7) × 14² = 616 cm².
Major-segment area = 616 − 17.80 = 598.20 cm².
Answer: Minor segment area ≈ 17.80 cm²; major segment area ≈ 598.20 cm².

Q6. 2 marks · Short answer

How can the area of a major sector or major segment be found from the area of the circle and its corresponding minor region?

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/maths/areas-related-to-circles

Q7. 2 marks · Short answer

A circle has radius 7 cm. Find the length of the arc subtending an angle of 90° at its centre. Use π = 22/7.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/maths/areas-related-to-circles

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