Areas Related to Circles

Identify whether the shaded region is a sector, a segment or a combination. A sector includes two radii; a segment is bounded by a chord and its arc.

Formulas and methods

Circumference = $2\pi r$ and circle area = πr^2.

For a central angle θ in degrees: arc length = $(\theta/360)2\pi r$; sector area = $(\theta/360)\pi r^2$.

Minor segment area = corresponding minor sector area − area of the triangle formed by the two radii and chord. Sector perimeter = arc length + 2r.

For central angles 60°,90°,120°, the radius triangle areas are respectively $\sqrt{3}r^2/4$, $r^2/2$, $\sqrt{3}r^2/4$.

Worked examples

Find the area and perimeter of a 90° sector of radius 14 cm, using π = 22/7.

Area = $(1/4) \times (22/7) \times 196 = 154$ cm². Arc length = $(1/4) \times 2 \times (22/7) \times 14 = 22$ cm. Perimeter = 22 + 28 = 50 cm.

Find the minor segment area for radius 6 cm and central angle 60°.

Sector area = $(60/360)\pi \times 36 = 6\pi$ cm². The radius triangle is equilateral with side 6, so its area is $9\sqrt{3}$ cm². Segment area = $(6\pi - 9\sqrt{3})$ cm².

Common mistake

Arc length is not the complete sector perimeter. Use square units for area. Keep π exact unless a value or approximation is requested.

Areas Related to Circles — practice

Try these without looking at the answers. Show substitutions and units. Difficulty labels describe these questions, not official CBSE classifications.

1. [Foundation] Find a circle area for radius 7 cm using π = 22/7.

2. [Core] Find the arc length of a 60° sector of radius 21 cm using π = 22/7.

3. [Core] Find the area of a 120° sector of radius 9 cm.

4. [Challenge] Find the minor segment area of a circle of radius 10 cm cut off by a 90° central angle.

Areas Related to Circles — answers

1. Find a circle area for radius 7 cm using π = 22/7.

Area = (22/7) × 49 = 154 cm².

2. Find the arc length of a 60° sector of radius 21 cm using π = 22/7.

(1/6) × 2 × (22/7) × 21 = 22 cm.

3. Find the area of a 120° sector of radius 9 cm.

(1/3)π × 81 = 27π cm².

4. Find the minor segment area of a circle of radius 10 cm cut off by a 90° central angle.

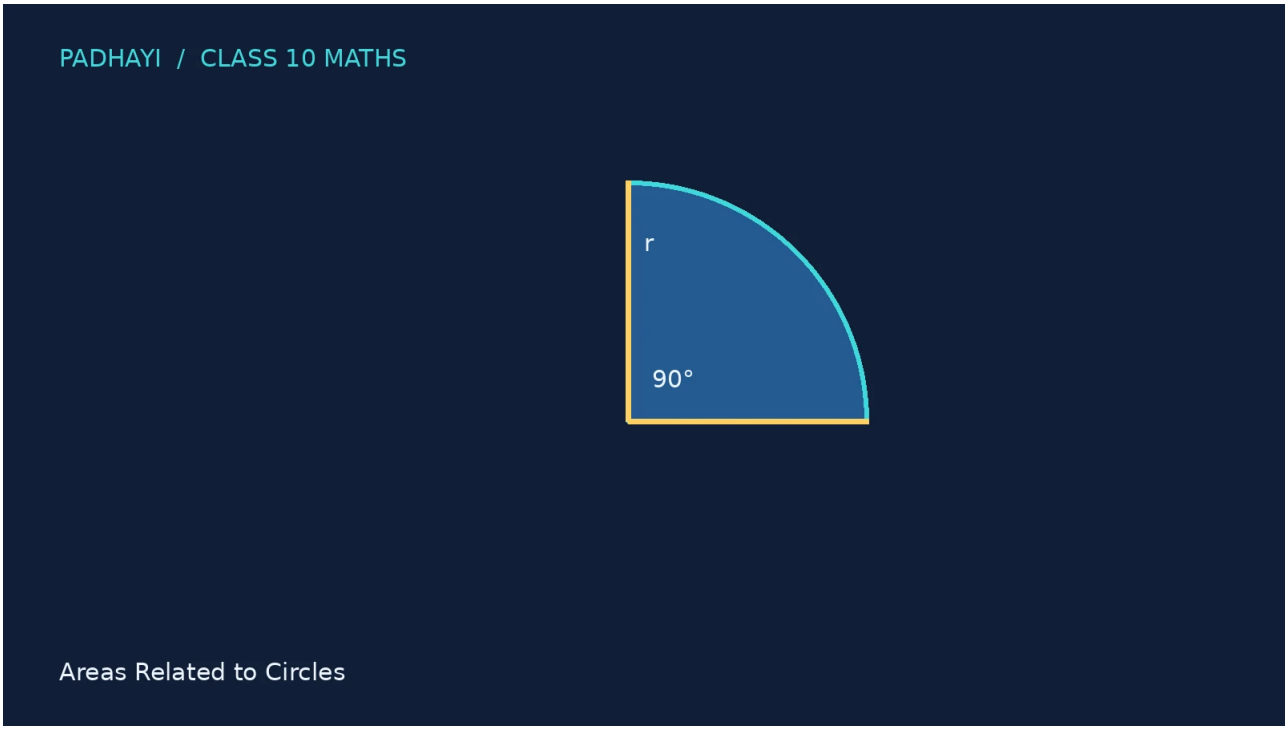
Sector = 25π; triangle = (1/2)×10×10 = 50. Segment = (25π − 50) cm².

Next step: explain one method aloud, then solve a question from your NCERT textbook without using this sheet.

Original Padhayi revision material. Independent study aid; not an official CBSE or NCERT publication. Syllabus reference: CBSE Mathematics, Class X, 2026–27.

Official CBSE syllabus | NCERT textbooks

Visual reminder



Schematic illustration; diagrams are not necessarily drawn to scale.