NCERT – GRADE 10 CHEAT SHEET

AREA OF SEGMENT

AREAS RELATED TO CIRCLES

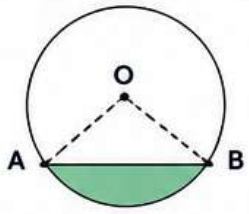
1 CHAPTER SNAPSHOT

DEFINITION:
A segment is the region enclosed by a chord and the corresponding arc of a circle.

KEY FINDING:
The area of a segment is obtained by subtracting the area of the triangle from the area of the corresponding sector.

SUPPORTING FACT:

- **Minor Segment:** Smaller region formed by a chord.
- **Major Segment:** Larger remaining region of the circle.
- Every chord divides a circle into one major and one minor segment.



Minor Segment

2 HIGH-YIELD CONCEPTS

- **Chord:** Line segment joining two points on a circle.
- **Segment:** Region enclosed by a chord and an arc.
- **Minor Segment:** Smaller enclosed region.
- **Major Segment:** Larger remaining region.
- **Sector:** Region enclosed by two radii and an arc.

KEY FINDING:

Area of Segment =
Area of Sector − Area of Triangle

SUPPORTING FACT:

For the major segment,

Major Segment =
Area of Circle − Minor Segment

3 COMPLETE FORMULA BANK

COMPARISON: Circle

$$\text{Area} = \pi r^2$$

COMPARISON: Sector

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

COMPARISON: Segment

Area of Segment =
Area of Sector − Area of Triangle

MAJOR SEGMENT

Major Segment = πr^2 − Minor Segment

AREA OF TRIANGLE (Choose as Applicable)

Type of Triangle	Formula
Right Triangle	$A = \frac{1}{2} \times base \times height$
Scalene Triangle (all sides are unequal)	$A = \sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{a+b+c}{2}$ [Heron's Formula]
Equilateral Triangle	$A = \frac{\sqrt{3}}{4} \times a^2$
When central angle θ and radius r are known	$A = \frac{1}{2} r^2 \sin\theta$

PROCESS STEP

Radius (r) → Central Angle (θ) → Find Area of Sector → Find Area of Triangle → Subtract to get Area of Segment

4 BOARD EXAM FOCUS & QUESTION HOTSPOTS

1 PROCESS_STEP: Area of Segment	• **Step 1:** Find the area of the sector. • **Step 2:** Find the area of the triangle. • **Step 3:** Subtract to obtain the area of the segment.
2 PROCESS_STEP: Major Segment	• Find the minor segment first. • Then, Major Segment = Area of Circle − Minor Segment
3 EXAMPLE TYPE	• Find the area of the minor segment when the radius and central angle are given.
4 KEY FINDING	Frequently Tested Questions ✓ Area of Minor Segment ✓ Area of Major Segment ✓ Segment using Sector − Triangle ✓ Real-life applications involving circular regions

5 SMART REVISION TIPS & COMMON MISTAKES

SMART REVISION TIPS

KEY FINDING

- ✓ Always calculate:
- ✓ Sector first
- ✓ Triangle next
- ✓ Segment last
- ✓ Draw neat labelled diagram
- ✓ Answer in square units (cm^2, m^2)

SUPPORTING FACT

Remember the order:

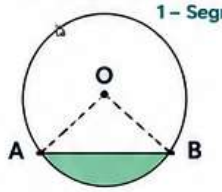
Sector → Triangle → Segment

COMMON MISTAKES

- ✗ Confusing sector with segment.
- ✗ Forgetting to subtract the triangle area.
- ✗ Using the major segment instead of the minor segment.
- ✗ Using incorrect triangle area formula.
- ✗ Writing incorrect units.

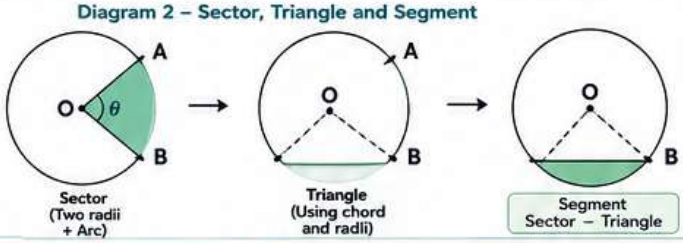
6 VISUAL MEMORY AID

1 – Segment



Segment =
Chord + Arc

Diagram 2 – Sector, Triangle and Segment



QUICK FORMULAS

Quantity	Formula
Area of Circle	πr^2
Area of Sector	$\frac{\theta}{360} \times \pi r^2$
Area of Triangle	See Section 3 (Choose as Applicable)
Area of Segment (Minor)	Sector − Triangle
Area of Segment (Major)	Circle − Minor Segment

7 30 SECOND RAPID REVISION

- ✓ Segment = Chord + Arc
- ✓ Area of Segment = Sector − Triangle
- ✓ Major Segment = Circle − Minor Segment
- ✓ Use appropriate triangle area formula
- ✓ Always calculate Sector first, then Triangle
- ✓ Draw neat diagram
- ✓ Answer in square units (cm^2, m^2)

KEY TAKEAWAY

To find the area of a segment, first find the area of the corresponding sector, then subtract the area of the enclosed triangle. For the major segment, subtract the minor segment from the area of the whole circle. This simple sequence helps avoid mistakes and solves most CBSE Class 10 questions easily.