

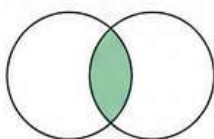
AREA OF COMBINED FIGURES



AREAS RELATED TO CIRCLES

1 CHAPTER SNAPSHOT

- ✓ **DEFINITION:** Combined figures are figures made by combining two or more simple shapes (circles, sectors, triangles, rectangles, etc.).
- ✓ **KEY FINDING:** The area of a combined figure is found by adding the areas of all the parts and subtracting the overlapped areas (if any).
- ✓ **SUPPORTING FACT:**
 - A complex figure can be divided into simpler parts.
 - Find the area of each part using relevant formula.
 - Add areas and subtract the overlapped parts.



2 HIGH-YIELD CONCEPTS

- **Combined Figure:** A figure made by combining two or more simple figures.
- **Division Method:** Divide the figure into simple shapes.
- **Addition:** Add the areas of all non-overlapping parts.
- **Subtraction:** Subtract the area of the overlapped part (if any).
- **Use of Formulas:** Apply the correct formula for each simple figure.

KEY FINDING:

$$\text{Area of Combined Figure} = \text{Sum of Areas of Parts} - \text{Area of Overlapping Region}$$

SUPPORTING FACT:

Choose the easiest division to reduce calculation and avoid complexity.

3 COMPLETE FORMULA BANK

CIRCLE

- Area = πr^2
- Circumference = $2\pi r$

SECTOR OF A CIRCLE

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

$$\text{Arc Length} = \frac{\theta}{360} \times 2\pi r$$

TRIANGLE

- Area = $\frac{1}{2} \times \text{base} \times \text{height}$
- Or Use any appropriate formula

RECTANGLE

$$\text{Area} = \text{length} \times \text{breadth}$$

COMBINED FIGURE FORMULA

$$\text{Area of Combined Figure} = \text{Sum of Area of All Parts} - \text{Area of Overlap (if any)}$$

PROCESS_STEP



4 BOARD EXAM FOCUS & QUESTION HOTSPOTS

- PROCESS_STEP:** Division of Figure
 - Divide the given figure into simple shapes like circles, sectors, triangles, rectangles, etc.
 - Choose the easiest division.
- PROCESS_STEP:** Area of Each Part
 - Apply the correct formula for each part.
 - Use radius, central angle, base, height, etc., as given.
- PROCESS_STEP:** Add & Subtract
 - Add the areas of all non-overlapping parts.
 - Subtract the overlapped part if any.
- EXAMPLE TYPE** Find the area of the shaded region in figures involving circles, sectors, rectangles, triangles, etc.
- KEY FINDING**
 - ✓ Frequently Tested Questions
 - ✓ Combination of circle and rectangle
 - ✓ Combination of circles (overlapping)
 - ✓ Combination of sector and triangle
 - ✓ Shaded region problems

5 SMART REVISION TIPS & COMMON MISTAKES

SMART REVISION TIPS

- ✓ Draw the figure neatly and label all dimensions.
- ✓ Divide into simple shapes.
- ✓ Use the correct formula for each part.
- ✓ Add and subtract carefully.
- ✓ Write the answer in square units (cm^2 , m^2).



SUPPORTING FACT

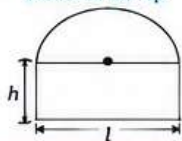
Visualising the figure before solving helps to choose the easiest method.

COMMON MISTAKES

- ✗ Not dividing the figure correctly.
- ✗ Using wrong formula for a part.
- ✗ Forgetting to subtract the overlapped area.
- ✗ Missing units in the final answer.
- ✗ Calculation mistakes while adding or subtracting areas.

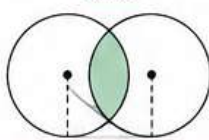
6 VISUAL MEMORY AID

Example 1: Rectangle with Semicircle on Top



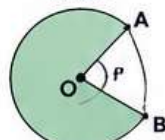
$$\text{Area} = \text{Area of Rectangle} + \text{Area of Semicircle}$$

Example 2: Two Overlapping Circles



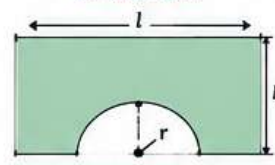
$$\text{Area} = \text{Area of Circle 1} + \text{Area of Circle 2} - \text{Area of Overlap}$$

Example 3: Sector with Triangle



$$\text{Area} = \text{Area of Sector} + \text{Area of Triangle}$$

Example 4: Shaded Region in Complex Figure



$$\text{Area} = \text{Area of Rectangle} - \text{Area of Semicircle}$$

QUICK FORMULAS

Figure / Part	Area Formula
Circle	πr^2
Sector of a Circle	$\frac{\theta}{360} \times \pi r^2$
Arc Length	$\frac{\theta}{360} \times 2\pi r$
Triangle	$\frac{1}{2} \times \text{base} \times \text{height}$ (or applicable formula)
Rectangle	$\text{length} \times \text{breadth}$
Combined Figure	$\text{Sum of parts} - \text{Overlap}$

7 30 SECOND RAPID REVISION

- ✓ Divide into simple shapes
- ✓ Find area of each part
- ✓ Add the areas
- ✓ Subtract the overlapped area (if any)
- ✓ Area of Combined Figure = Sum of Areas – Overlap
- ✓ Answer in square units (cm^2 , m^2)

KEY TAKEAWAY

To find the area of a combined figure, first divide it into simple parts. Calculate the area of each part using the appropriate formula. Add the areas of all parts and subtract the area of any overlapped region. Choosing the easiest division and applying the correct formula carefully helps solve most CBSE Class 10 questions quickly and accurately.

