

Segments of a Circle – Solutions

Class 10 Mathematics | CBSE | Olympiad Preparation | Two-page Worksheet

Name: _____

Roll No.: _____

Class: **10**

Date: _____

Marks: / 10

Instructions

1. Attempt all five questions. Total marks: 10.
2. Leave answers in terms of π and square roots unless stated otherwise.
3. Show essential working for Questions 4 and 5.
4. Diagrams are not necessarily drawn to scale.

Learning objectives

- Distinguish between a sector and a segment of a circle.
- Calculate segment areas using sectors and triangles.
- Connect chord length, central angle and segment area.

Page 1 | Section A – Multiple Choice

Choose the single correct option for each question. Each question carries 1 mark.

- 1** 1. A chord AB is not a diameter of a circle. Which description correctly identifies the minor segment cut off by AB? [1]
- (a) The region bounded by OA, OB and the minor arc AB, where O is the centre
- (b) The region bounded by chord AB and the minor arc AB ✓**
- (c) The region bounded by chord AB and the major arc AB
- (d) The triangle formed by OA, OB and AB

Explanation: A segment is bounded by a chord and its corresponding arc; the minor arc bounds the minor segment.

- 2** 2. A chord subtends an angle of 90° at the centre of a circle of radius 7 cm. Using $\pi = \frac{22}{7}$, what is the area of the minor segment? [1]
- (a) 24.5 cm^2 (b) 38.5 cm^2 **(c) 14 cm^2 ✓** (d) 28 cm^2

Explanation: Minor segment area = quarter-circle area – triangle area = $\frac{1}{4} \times \frac{22}{7} \times 49 - \frac{1}{2} \times 49 = 14 \text{ cm}^2$.

3. A chord subtends 90° at the centre of a circle. What fraction of the corresponding minor sector is occupied by the minor segment?

(a) $\frac{\pi - 2}{\pi}$ ✓

(b) $\frac{2}{\pi}$

(c) $\frac{\pi - 2}{4\pi}$

(d) $\frac{\pi}{\pi + 2}$

Explanation: For radius r , the sector area is $\pi r^2/4$ and the triangle area is $r^2/2$. Dividing their difference by the sector area gives $(\pi - 2)/\pi$.

Reasoning checkpoint

Before turning the page, check that you have distinguished the area of a sector from the area of a segment. For a minor central angle below 180° , subtract the triangle area from the minor sector area.