



Attempt questions first; check the separate key afterward. Unstated lengths are in cm. Exact answers in π are acceptable; use $\pi=22/7$ for numerical values.

A. Very short answers - 1 mark each

1. Write area formula for a circle.
2. Write circumference formula.
3. Find area of radius 7 cm circle using $\pi=22/7$.
4. Find circumference for radius 14 cm.
5. Define a sector.
6. Define a segment.
7. Find area of a semicircle of radius 2.
8. Does doubling radius double area?

B. Short answers / practice - 2 marks each

9. Find area of 90° sector of radius 14 cm.
10. Find arc length of 60° sector of radius 21 cm.
11. Find area of 60° sector with radius 6.
12. Find perimeter of a semicircle of radius 7 cm.
13. Find area of a quadrant of radius 8.
14. Find ring area for radii 10 and 6.
15. Find sector angle if area is one-fifth of circle area.
16. Find radius when circumference is 44 cm, $\pi=22/7$.
17. Find area of square inscribed in circle of radius 5.
18. Find area between a circle of radius 7 and its circumscribed square.
19. Find arc length of 120° sector of radius 9.
20. Find sector area if arc length is 10 and radius 6.

C. Application / reasoning - 3 marks each

21. Find minor segment area for radius 14 cm and central angle 90° .
22. Find minor segment area for radius 12 and central angle 60° .

23. A wheel radius 35 cm makes 100 revolutions. Find distance.

24. Find area of a circular path of width 2 m around a radius 7 m garden.

25. Find shaded remainder of a radius 10 circle after removing a 90° sector.

26. Can equal arcs in circles of different radii subtend unequal angles?

27. Find the area of a 120° sector of radius 6 cm.

28. Find perimeter of a quadrant of radius 14 cm; use $\pi=22/7$.

29. Find area of a ring with outer radius 13 cm and inner radius 5 cm.

30. A wheel of diameter 70 cm travels 440 m. Find revolutions; use $\pi=22/7$.

31. Find area of the minor segment for radius 10 cm and central angle 90° .

D. Extended practice - 5 marks each

32. Derive the area and arc-length formulae for a sector using proportionality.

33. A square of side 14 cm contains four non-overlapping quadrants of radius 7 at its corners. Find central uncovered area.

34. Find area of a stadium shape: rectangle 20 m by 14 m with semicircles on its 14 m ends.

35. A horse is tied at one corner of a 20 m square by a 7 m rope. Find grazable area inside the square.

ANSWER KEY - Numerical / closed questions

1) πr^2 . 2) $2\pi r$. 3) 154 cm^2 . 4) 88 cm. 7) 2π . 8) No; it quadruples. 9) 154 cm^2 . 10) 22 cm. 11) 6π . 12) 36 cm. 13) 16π . 14) 64π . 15) 72° . 16) 7 cm. 17) 50 square units. 18) 42 cm^2 , $\pi=22/7$. 19) 6π . 20) 30 square units. 21) 56 cm^2 , $\pi=22/7$. 22) $24\pi - 36\sqrt{3}$. 23) 220 m, $\pi=22/7$. 24) $32\pi \text{ m}^2$. 25) 75π . 26) Yes. 27) $12\pi \text{ cm}^2$. 28) 50 cm. 29) $144\pi \text{ cm}^2$. 30) 200. 31) $25\pi - 50 \text{ cm}^2$. 33) 42 cm^2 , $\pi=22/7$. 34) 434 m^2 , $\pi=22/7$. 35) 38.5 m^2 , $\pi=22/7$.