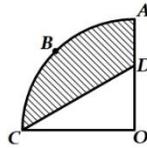


7. Find the area of a quadrant of a circle, where the circumference of circle is 44 cm . [Use $\pi = \frac{22}{7}$]

CBSE 2011, Delhi (30/1/1)

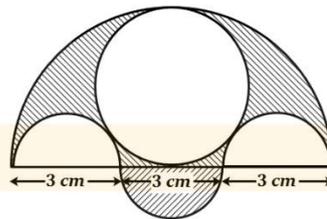
8. In figure, $OACB$ is a quadrant of a circle with centre O and radius 3.5 cm . If $OD = 2\text{ cm}$, find the area of the shaded region. [Use $\pi = \frac{22}{7}$]



CBSE 2011, Foreign (30/2/1)

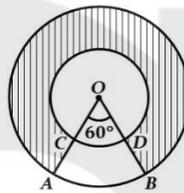
3 Marks:

1. Three semicircles each of diameter 3 cm , a circle of diameter 4.5 cm and a semicircle of radius 4.5 cm are drawn in the given figure. Find the area of the shaded region.



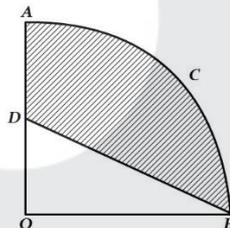
CBSE 2017, Outside Delhi (30/1)

2. In the given figure, two concentric circles with centre O have radii 21 cm and 42 cm . If $\angle AOB = 60^\circ$, find the area of the shaded region. [Use $\pi = \frac{22}{7}$]



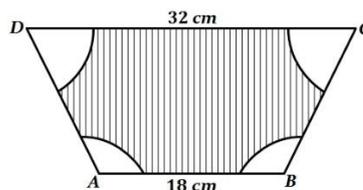
CBSE 2017, Outside Delhi (30/1)

3. In the given figure, $OACB$ is a quadrant of a circle with centre O and radius 3.5 cm . If $OD = 2\text{ cm}$, find the area of the shaded region.



CBSE 2017, Delhi (30/1/1)

4. In the given figure, $ABCD$ is a trapezium with $AB \parallel DC$, $AB = 18\text{ cm}$, $DC = 32\text{ cm}$ and the distance between AB and DC is 14 cm . If arcs of equal radii 7 cm taking A, B, C and D as centres, have been drawn, then find the area of the shaded region.

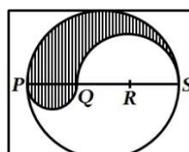


CBSE 2017, Foreign (30/2/1)

5. Find the area of the minor segment of a circle of radius 42 cm , if the length of the corresponding arc is 44 cm .

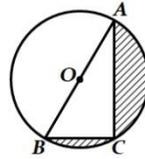
CBSE Sample Paper 2017

6. In given figure, PS is the diameter of a circle of radius 6 cm . The points Q and R trisect the diameter PS . Semi circles are drawn on PQ and RS as diameters. Find the area of the shaded region.



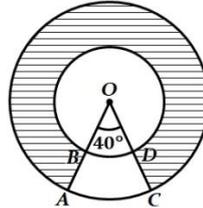
CBSE Sample Paper 2017

7. In figure, O is the centre of a circle such that diameter $AB = 13 \text{ cm}$ and $AC = 12 \text{ cm}$. BC is joined. Find the area of the shaded region. (Take $\pi = 3.14$)



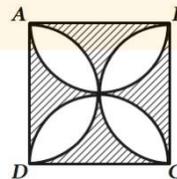
CBSE 2016, Outside Delhi (30/1)

8. In figure, find the area of the shaded region, enclosed between two concentric circles of radii 7 cm and 14 cm where $\angle AOC = 40^\circ$. (Use $\pi = \frac{22}{7}$)



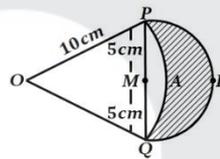
CBSE 2016, Outside Delhi (30/1)

9. In figure, $ABCD$ is a square of side 14 cm . Semi-circles are drawn with each side of square as diameter. Find the area of the shaded region. (use $\pi = \frac{22}{7}$)



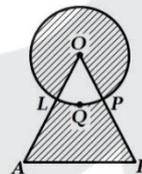
CBSE 2016, Delhi (30/1/1)

10. In figure, are shown two arcs PAQ and PBQ . Arc PAQ is a part of circle with centre O and radius OP while arc PBQ is a semi-circle drawn on PQ as diameter with centre M . If $OP = PQ = 10 \text{ cm}$, show that area of shaded region is $25 \left(\sqrt{3} - \frac{\pi}{6} \right) \text{ cm}^2$.



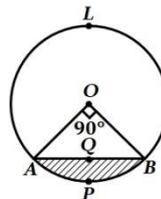
CBSE 2016, Delhi (30/1/1)

11. Find the area of shaded region in figure, where a circle of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm . (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)



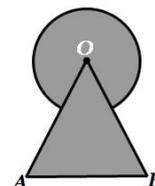
CBSE 2016, Foreign (30/2/1)

12. In figure, is a chord AB of circle, with centre O and radius 10 cm , that subtends a right angle at the centre of the circle. Find the area of the minor segment AQB . Hence find the area of major segment $ALBQA$. (Use $\pi = 3.14$)



CBSE 2016, Foreign (30/2/1)

13. Find the area of shaded region shown in the given figure where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.

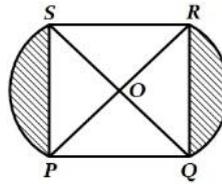


CBSE Sample Paper 2016

14. Find the area of the minor segment of a circle of radius 14 cm , when its central angle is 60° . Also find the area of the corresponding major segment. [Use $\pi = \frac{22}{7}$]

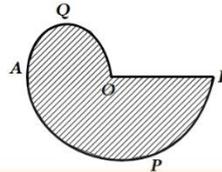
CBSE 2015, Outside Delhi (30/1)

15. In figure, $PQRS$ is a square lawn with side $PQ = 42$ metres. Two circular flower beds are there on the sides PS and QR with centre at O , the intersection of its diagonals. Find the total area of the two flower beds (shaded parts).



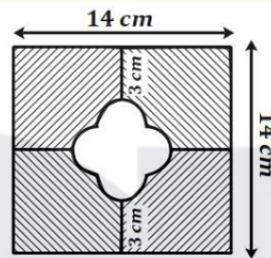
CBSE 2015, Outside Delhi (30/1)

16. In figure, APB and AQO are semicircles, and $AO = OB$. If the perimeter of the figure is 40 cm , find the area of the shaded region. [Use $\pi = \frac{22}{7}$]



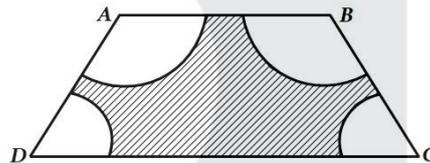
CBSE 2015, Delhi (30/1/1)

17. In figure, find the area of the shaded region [Use $\pi = 3.14$]



CBSE 2015, Delhi (30/1/1)

18. In figure, $ABCD$ is a trapezium with $AB \parallel DC$, $AB = 18\text{ cm}$, $DC = 32\text{ cm}$ and the distance between AB and DC is 14 cm . If arcs of equal radii 7 cm have been drawn, with centres A, B, C and D , then find the area of the shaded region.

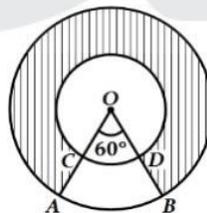


CBSE 2015, Foreign (30/2/1)

19. The long and short hands of a clock are 6 cm and 4 cm long respectively. Find the sum of the distances travelled by their tips in 24 hours. (Use $\pi = 3.14$)

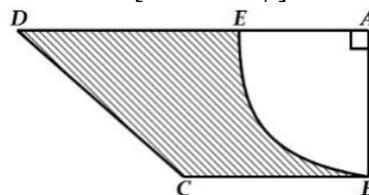
CBSE 2015, Foreign (30/2/1)

20. In Figure two concentric circles with centre O , have radii 21 cm and 42 cm . If $\angle AOB = 60^\circ$, find the area of the shaded region. [Use $\pi = \frac{22}{7}$]



CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

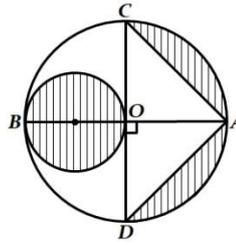
21. In Figure $ABCD$ is a trapezium of area 24.5 sq. cm . In it, $AD \parallel BC$, $\angle DAB = 90^\circ$, $AD = 10\text{ cm}$ and $BC = 4\text{ cm}$. If ABE is a quadrant of a circle, find the area of the shaded region. [Take $\pi = \frac{22}{7}$]



CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

22. In figure, AB and CD are two diameters of a circle with centre O , which are perpendicular to each other. OB is the diameter of the smaller circle. If $OA = 7\text{ cm}$, find the area of the shaded region.

$\left[\text{Use } \pi = \frac{22}{7} \right]$



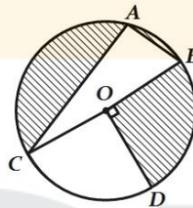
CBSE 2013, Delhi (30/1/1)

23. In a circle of radius 21 cm , an arc subtends an angle of 60° at the centre.
Find :
(i) the length of the arc
(ii) area of the sector formed by the arc.

$\left[\text{Use } \pi = \frac{22}{7} \right]$

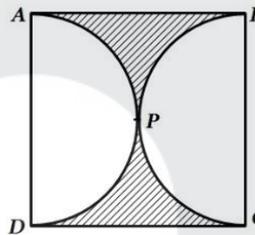
CBSE 2013, Delhi (30/1/1)

24. In figure, O is the centre of the circle with $AC = 24\text{ cm}$, $AB = 7\text{ cm}$ and $\angle BOD = 90^\circ$. Find the area of the shaded region.



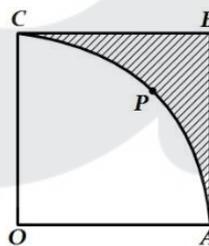
CBSE 2012, Outside Delhi (30/1)

25. In figure, find the area of the shaded region, if $ABCD$ is a square of side 14 cm and APD and BPC are semicircles.



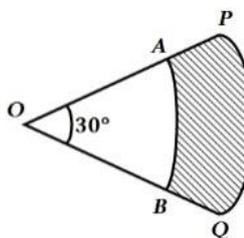
CBSE 2012, Outside Delhi (30/1)

26. In figure, $OABC$ is a square of side 7 cm . If $OAPC$ is a quadrant of a circle with centre O , then find the area of the shaded region. $\left[\text{Use } \pi = \frac{22}{7} \right]$



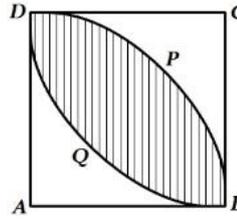
CBSE 2012, Delhi (30/1/1)

27. In figure, PQ and AB are respectively the arcs of two concentric circles of radii 7 cm and centre O . If $\angle POQ = 30^\circ$, then find the area of the shaded region. $\left[\text{Use } \pi = \frac{22}{7} \right]$



CBSE 2012, Delhi (30/1/1)

28. In figure, $ABCD$ is a square of side 7 cm . $DPBA$ and $DQBC$ are quadrants of circles, each of radius 7 cm . Find the area of the shaded region. [Use $\pi = \frac{22}{7}$]



CBSE 2012, Foreign (30/2/1)

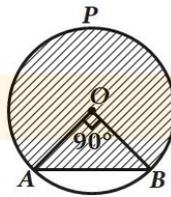
29. The length of the minute hand of a clock is 14 cm . Find the area swept by the minute hand in 10 minutes.

CBSE 2012, Foreign (30/2/1)

30. A chord of a circle of radius 14 cm subtends an angle of 120° at the centre. Find the area of the corresponding minor segment of the circle. [Use $\pi = \frac{22}{7}$ and $\sqrt{3} = 1.73$]

CBSE 2011, Outside Delhi (30/1)

31. Find the area of the major segment APB , in figure, of a circle of radius 35 cm and $\angle AOB = 90^\circ$. [Use $\pi = \frac{22}{7}$]

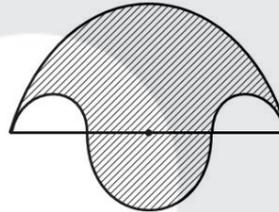


CBSE 2011, Delhi (30/1/1)

32. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment and hence find the area of the major segment. [Use $\pi = 3.14$]

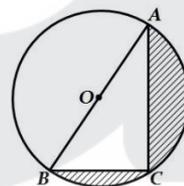
CBSE 2011, Foreign (30/2/1)

33. In Fig. the boundary of shaded region consists of four semi-circular arcs, two smallest being equal. If diameter of the largest is 14 cm and that of the smallest is 3.5 cm , calculate the area of the shaded region. [Use $\pi = \frac{22}{7}$]



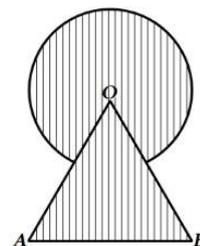
CBSE 2010, Delhi (30/1/1)

34. Find the area of the shaded region in Fig. if $AC = 24\text{ cm}$, $BC = 10\text{ cm}$ and O is the centre of the circle. [Use $\pi = 3.14$]



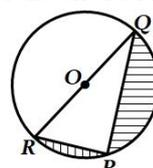
CBSE 2010, Delhi (30/1/1)

35. Find the area of the shaded region in Figure 3, where a circular arc of radius 7 cm has been drawn with vertex O of an equilateral triangle OAB , of side 12 cm , as centre.



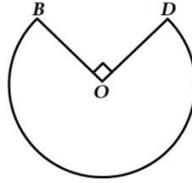
CBSE 2010, Foreign (30/2/1)

36. In Figure, $PQ = 24\text{ cm}$, $PR = 7\text{ cm}$ and O is the centre of the circle. Find the area of shaded region (take $\pi = 3.14$)



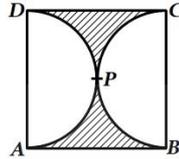
CBSE 2009, Delhi (30/1/1)

37. In Figure, the shape of the top of a table in a restaurant is that of a sector of a circle with centre O and $\angle BOD = 90^\circ$. If $BO = OD = 60\text{ cm}$, find
- the area of the top of the table.
 - The perimeter of the table top.
- (Take $\pi = 3.14$)



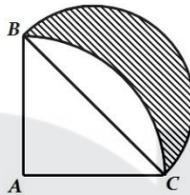
CBSE 2009, Foreign (30/2/1)

38. In Figure, $ABCD$ is a square of side 14 cm and APD and BPC are semicircles. Find the area of shaded region.
(Take $\pi = \frac{22}{7}$)



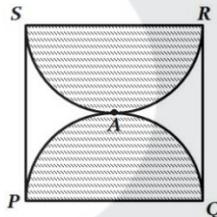
CBSE 2009, Foreign (30/2/1)

39. In Fig., ABC is a quadrant of a circle of radius 14 cm and a semi-circle is drawn with BC as diameter. Find the area of the shaded region.



CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)

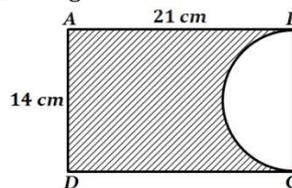
40. $PQRS$ is a square land of side 28 m . Two semicircular grass covered portions are to be made on two of its opposite sides as shown in the figure. How much area will be left uncovered? (Take $\pi = \frac{22}{7}$)



CBSE Sample Paper II 2008

4 Marks:

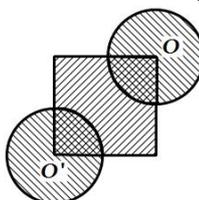
1. In the given figure, $ABCD$ is a rectangle of dimensions $21\text{ cm} \times 14\text{ cm}$. A semicircle is drawn with BC as diameter. Find the area and the perimeter of the shaded region in the figure.



CBSE 2017, Outside Delhi (30/1)

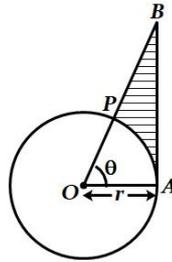
2. A chord PQ of a circle of radius 10 cm subtends an angle of 60° at the centre of circle. Find the area of major and minor segments of the circle.
CBSE 2017, Delhi (30/1/1)

3. In the given figure, the side of square is 28 cm and radius of each circle is half of the length of the side of the square where O and O' are centres of the circles. Find the area of shaded region.



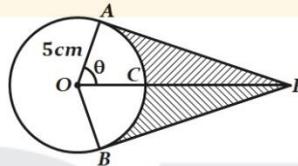
CBSE 2017, Delhi (30/1/1)

4. Two circles touch internally. The sum of their areas is $116 \pi \text{ cm}^2$ and the distance between their centres is 6 cm . Find the radii of the circles. **CBSE 2017, Foreign (30/2/1)**
5. A park is of the shape of a circle of diameter 7 m . It is surrounded by a path of width of 0.7 m . Find the expenditure of cementing the path, if its cost ₹ 110 per sq. m . **CBSE 2017, Foreign (30/2/1)**
6. In figure, is shown a sector OAP of a circle with centre O , containing $\angle \theta$. AB is perpendicular to the radius OA and meets OP produced at B . Prove that the perimeter of shaded region is $r \left[\tan \theta + \sec \theta + \frac{\pi \theta}{180} - 1 \right]$



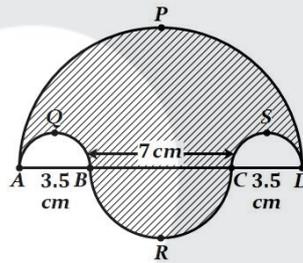
CBSE 2016, Outside Delhi (30/1)

7. An elastic belt is placed around the rim of a pulley of radius 5 cm . From one point C on the belt, the elastic belt is pulled directly away from the centre O of the pulley until it is at P , 10 cm from the point O . Find the length of the belt that is still in contact with the pulley. Also find the shaded area. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)



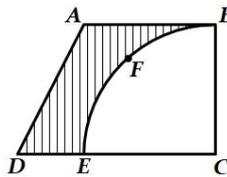
CBSE 2016, Delhi (30/1/1)

8. Find the area of the shaded region in figure, where \widehat{APD} , \widehat{AQB} , \widehat{BRC} and \widehat{CSD} are semi-circles of diameter 14 cm , 3.5 cm , 7 cm and 3.5 cm respectively. [Use $\pi = \frac{22}{7}$]



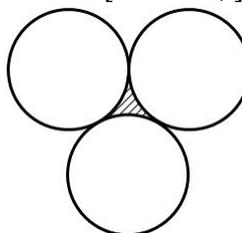
CBSE 2016, Foreign (30/2/1)

9. Four equal circles are described at the four corners of a square so that each touches two of the others. The shaded area enclosed between the circles is $\frac{24}{7} \text{ cm}^2$. Find the radius of each circle. **CBSE Sample Paper 2016**
10. From a thin metallic piece, in the shape of a trapezium $ABCD$ in which $AB \parallel CD$ and $\angle BCD = 90^\circ$, a quarter circle $BFEC$ is removed. Given $AB = BC = 3.5 \text{ cm}$ and $DE = 2 \text{ cm}$, calculate the area of the remaining (shaded) part of the metal sheet. [Use $\pi = \frac{22}{7}$]



CBSE 2011, Foreign (30/2/1)

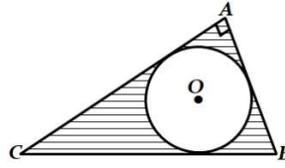
11. In figure, three circles each of radius 3.5 cm are drawn in such a way that each of them touches the other two. Find the area enclosed between these three circles (shaded region). [Use $\pi = \frac{22}{7}$]



CBSE 2011, Outside Delhi (30/1)

6 Marks:

1. In Figure, ABC is a right triangle right angled at A . Find the area of shaded region, if $AB = 6\text{ cm}$, $BC = 10\text{ cm}$ and O is the centre of the incircle of $\triangle ABC$. [Take $\pi = 3.14$]



CBSE 2009, Delhi (30/1/1)

