

Class: X
Subject: Mathematics
Topic: Area Related to Circle
No. of Questions: 18
Duration: 60 Min
Maximum Marks: 60

- Q1. A man runs around a circle of radius 50 m at a speed of 12 km/h. The time taken by him for going around it ten times is _____.
- A. 10 mins 42 secs
B. 12 mins 35 secs
C. 15 mins 42 sees
D. 10 mins 35 sees

Sol: c

Circumference of circle : $2\pi r = 100\pi$
Total Distance to be covered = $10 * 100\pi = 1000\pi$
Speed = $12\text{km/h} = 10/3\text{m/s}$
Time = Distance / Speed

- Q2. The diameter of the driving wheel of a bus is 140 cm. How many revolutions per minute must the wheel make in order to keep a speed of 66 km per hour?
- A. 200
B. 210
C. 250
D. 240

Sol: c

Circumference = $2\pi r = 440\text{cm} = 4.4\text{m}$
Speed in m/min = 1100m/min
Revolutions = Distance per minute / Circumference

- Q3. Circle C1 passes through the center of circle C2 and is tangential to it. If the area of C1 is 4 cm^2 , then the area of C2 is.
- A. 8 cm^2
 - B. $8\sqrt{\pi} \text{ cm}^2$
 - C. 16 CM^2
 - D. $16\sqrt{\pi} \text{ CM}^2$

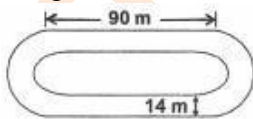
Sol: C Hint: Radius of bigger one will be diameter of smaller one. So area will become 4times the smaller one.

- Q4. The area of a square and a circle are same. If area of the square is 3696 sq. cm , the distance covered when 8 rounds are taken round the circle (approximately), is _____.
- A. 1787 cm
 - B. 1700 cm
 - C. 1800 cm
 - D. 2000 cm

Sol: A

From area of square find radius of circle (Since areas are same)
Then find perimeter of circle and multiply by 8 to get the answer.

- Q5. The inside perimeter of a running track is 400 m. The length of each of the straight portion is 90 m and the ends are semi-circular. If the track is 14 m wide everywhere, the length of the outer running track is _____.

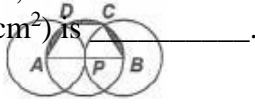


- A. 480 m
- B. 482 m
- C. 450 m
- D. 488 m

Sol: D

Inner perimeter = $90+90+ 2*(\text{perimeter of inner semi-circle})$
From this get inner radius. Add 14 to get outer radius and find the length of outer running track hence.

- Q6. AB is a line segment of length 4 cm. P is the mid-point of AB. Circles are drawn with A, P and B as centers and radii $AP = PB$ (see figure). The area of the shaded portion (in cm^2) is _____.



- A. $6\sqrt{3}$
 B. $2\pi - 6\sqrt{3}$
 C. $2\pi - 3\sqrt{3}$
 D. $3\sqrt{3}$

Sol: C

By symmetry if we join PD and PC, 3 equilateral triangles will be formed with side = radius = 2 cm

Required area = Area of semi-circle - 3 * area of equilateral triangles.

- Q7. A square park has each side 100 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 14 m. The area of the remaining part of the park is _____.

- A. 9548 m^2
 B. 9348 m^2
 C. 9384 m^2
 D. 9684 m^2

Sol: C

Area of square - Area of circle (As 4 quadrants will form 1 circle.)

- Q8. A rectangle contains three circles as in the diagram, all tangent to the rectangle and to one another. If the height of the rectangle is 4 cm, then the width of the rectangle is _____.

- A. $3 + 2\sqrt{2} \text{ CM}$
 B. $4 + \frac{4\sqrt{2}}{3}$
 C. $5 + \frac{2\sqrt{2}}{3}$
 D. 6 CM

Sol: A

Radius of bigger circle= 2cm Radius of smaller circle=1cm

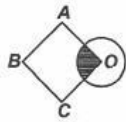
Width of rectangle is $AL+LM+MB=$ Radius of bigger circle+ KO_1 + Radius of smaller circle.

KO_1 can be found by Pythagoras theorem in triangle OKO_1

$OK= OL-KL= 2-1=1\text{cm}$

$OO_1= 2+1 = 3\text{cm.}$

- Q9. O is the centre of a circle of diameter 4 cm and OABC is a square, if the shaded area is $1/3$ area of the square, then the side of the square is _____.



- A. $\pi \sqrt{3}$ CM
 B. $\sqrt{3} \pi$ CM
 C. $3\sqrt{\pi}$ CM
 D. 3π CM

Sol: B

Area of quadrant = $1/3$ Area of square.

Radius is 2. Find by substituting accordingly.

- Q10. If the perimeter of a semicircular protractor is 36 cm, its diameter is _____.
- A. 10 cm
 B. 12 cm
 C. 15 cm
 D. 14 cm

Sol: D

Perimeter of semicircle = $\pi r + d=36$

$r(\pi+2)=36$

$r= 36/ (\pi+2) =7$

Q11. The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. The area of the sector is _____.

- A. 15.1 cm²
- B. 15.5 cm²
- C. 15.6 cm²
- D. 15.9 cm²

Sol: C

Perimeter of sector is $2r + \text{arc length} = 16.4$
Arc length = 6
 $\theta = l/r = 6/5.2$ radians
Area of sector = $(\theta/2\pi)(\pi r^2)$

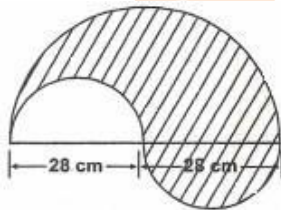
Q12. The inner circumference of a circular track is 24 π m. The track is 2 m wide from everywhere. The quantity of wire required to surround the path completely is _____.

- A. 80 m
- B. 81 m
- C. 82 m
- D. 88 m

Sol: D

Circumference of outer circle.
First find radius of inner circle from given info. Then outer circumference can easily be find.

Q13. Perimeter of the shaded figure is _____.



- A. 200 cm
- B. 196 cm
- C. 186 cm
- D. 176 cm

Sol: D

Total = Perimeter of bigger semi-circle

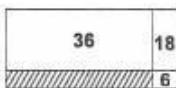
Q14. The areas of two concentric circles are 962.5 cm^2 and 1386 cm^2 respectively. The width of the ring is _____.

- A. 3.4 cm
- B. 3.5 cm
- C. 3.2 cm
- D. 3.1 cm

Sol: B

Find the radius of inner and outer portions. Width will be = Outer – Inner Radius

Q15. A rectangle is divided into four smaller rectangles, as shown in the figure. Three of them have areas 6 cm^2 , 18 cm^2 and 36 cm^2 as indicated. The area of the shaded rectangle is _____.



- A. 30 cm^2
- B. 24 cm^2
- C. 12 cm^2
- D. 18 cm^2

Sol: C

Writing the dimensions
 Start with smaller as 2×3
 From this the one having area 18 can be written as 6×3
 The one having area 36 can be written as 6×6
 Shaded part will then become $6 \times 2 = 12 \text{ cm}^2$

Q16. A car is moving with the speed of 22 decimeter per second. If it performs 7 revolutions per second, the diameter of the wheel is _____.

- A. 0.05 m
- B. 0.2 m
- C. 1.5 m
- D. 0.1 m

Sol: D

In Sec
 Distance move $22 \text{ dm} = 2.2 \text{ m}$
 Movement is due to revolution of tire = No of revolution * circumference of tire
 $2.2 = 7 \times 2\pi R$
 $R = 0.05 \text{ m}$
 Diameter = 0.1 m

- Q17. The diameter of a protractor is 14 cm. Its perimeter is
- A. 29 cm
 - B. 22 cm
 - C. 36 cm
 - D. 58 cm

Sol: C

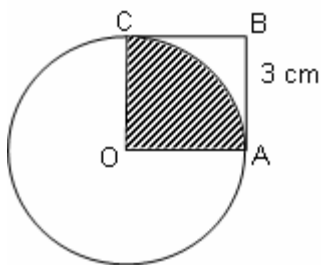
Perimeter is $\pi \cdot r + d = 22 + 14 = 36$

- Q18. The minute hand of a clock is 21 cm. The travelled by tip of hour hand in 1 hour is = ___ cm.
- A. 33
 - B. 22
 - C. 11
 - D. 132

Sol: C

In 1 hr hour hand moves by $\frac{1}{12}(360) = 30^\circ = \frac{\pi}{6}$ Distance travelled will be arc of the circle having radius 21 and subtending $\frac{\pi}{6}$ at centre $L = R\theta = 21 \cdot \frac{\pi}{6} = 11\text{cm}$

- Q19. In the given figure, OABC is a square of side 3 cm occupying a quadrant of a circle. The area of the shaded portion will be

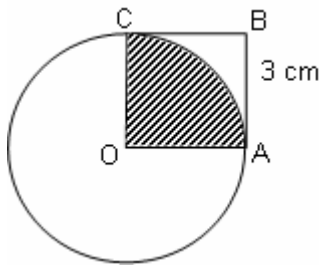


- A. $\frac{6}{4} \pi \text{ cm}^2$
- B. $\frac{3}{4} \pi \text{ cm}^2$
- C. $\frac{27}{4} \pi \text{ cm}^2$

D. $\frac{9}{4} \pi \text{ cm}^2$

Sol: D

Area of circle = πr^2



Area of quadrant of the circle = $\frac{1}{4} \pi r^2$, where r is the radius of the circle.

Thus, the area of the shaded portion = $\frac{1}{4} \pi \times 3^2$

$$= \frac{1}{4} \pi 9$$
$$= \frac{9}{4} \pi \text{ cm}^2$$

Q20. If the perimeter of a circle is 14π cm, then find its radius.

- A. 7 cm
- B. 14 cm
- C. $\sqrt{14}$ cm
- D. $\sqrt{7}$ cm

Right Answer Explanation: A

If r is the radius of a circle, then perimeter of the circle is $2\pi r$.

$$\Rightarrow 2\pi r = 14\pi$$

$$\Rightarrow r = \frac{14}{2} = 7 \text{ cm}$$

Hence, the radius of the circle is 7 cm.