15. Circumference of a Circle and Area

Exercise 15.1

1. Question

The radius of a circle is 3.5 cm. Find the circumference and area of the circle.

Answer

Given that radius of the circle = 3.5 cm

We know that circumference of the circle = $2\pi r$

$$\Rightarrow \text{Circumference} = 2 \times \frac{22}{7} \times 3.5 = 22 \text{ cm}$$

Also, the area of a circle = πr^2

$$\Rightarrow \text{Area} = \frac{22}{7} \times 3.5 \times 3.5 = 38.5 \text{ cm}^2$$

2. Question

The circumference of a wheel is 44 m. find the area of the circle.

Answer

Given that circumference of the circle = 44 m

We know that circumference of the circle = $2\pi r$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 44$$

$\Rightarrow r = 7$ m

Also, the area of a circle = πr^2

$$\Rightarrow \text{Area} = \frac{22}{7} \times 7 \times 7 = 154 \text{ m}^2$$

3. Question

The radius of a semicircular plot is 21 m. Find its area and perimeter.

Answer

A semicircle is a half of the circle.

Given that radius of the semicircular plot = 21 m

To find the perimeter of the semicircular plot, we need to find the perimeter of the semicircle and add the diameter of the circle to it.

Diameter = AB = 2×radius = 2× 21 = 42 m

We know that circumference of the circle = 2πr

⇒ Perimeter of semicircle = πr

⇒ Perimeter of semicircle $= \frac{22}{7} \times 21 = 66\ \text{m}$

Total perimeter of the semicircular plot = 66 +42 = 108 m

Also, the area of a circle = πr^2

⇒ Area of semicircle $= \pi\frac{r^2}{2}$

⇒ Area of semicircular plot $= \frac{22}{7\times2} \times 21 \times 21$

⇒ Area of semicircular plot $= 693\text{m}^2$

4. Question

A scooter wheel makes 100 revolutions in covering a distance of 88 m. Find the radius of the wheel.

Answer

Distance travelled by the wheel of the scooter = 88 m in 100 revolutions

Distance travelled in 1 revolution $= \frac{88}{100}\ \text{m} = 88\ \text{cm}$

Distance travelled in 1 revolution of a wheel = circumference of the wheel

We know that circumference of the circle = 2πr

$\Rightarrow 2 \times \frac{22}{7} \times r = 88$

⇒ r = 14 cm

5. Question

The area of a circular plate is 154 cm^2. Find its circumference.

Answer

Given that the area of a circle = 154 cm^2

We know that the area of a circle = πr^2

$$\Rightarrow \frac{22}{7} \times r \times r = 154\ cm^2$$

$\Rightarrow$ r = 7 cm

Also, the circumference of the circle = $2\pi r$

$$\Rightarrow \text{Circumference} = 2 \times \frac{22}{7} \times 7 = 44\ cm$$

6. Question

The circumference of a circle is equal to perimeter of a square. If area of the square is 484 m^2, then find the area of the circle.

Answer

Given area of the square = 484 m^2

We know that area of the square = $(Side)^2$

$\Rightarrow (Side)^2 = 484$

$\Rightarrow$ side = 22 m

Also, given that circumference of a circle = perimeter of a square

We know that circumference of the circle = $2\pi r$

And the perimeter of a square = 4× length of the side

$\Rightarrow$ Perimeter of square = 4×22 = 88 m

$\Rightarrow$ Circumference of circle = 88 m

$$\Rightarrow 2 \times \frac{22}{7} \times r = 88$$

$\Rightarrow$ r = 14 m

Also, the area of a circle = πr^2

$$\Rightarrow \text{Area} = \frac{22}{7} \times 14 \times 14 = 616\ \text{m}^2$$

7. Question

The cost of fencing a circular field at the rate of 24 per metre is 5280. The field is to be ploughed at the rate of 0.50 per m^2. Find the cost of ploughing the field.

Answer

Given that cost of fencing a circular field at the rate of Rs 24 per meter = Rs 5280

Fencing takes place at the circumference of the circular field.

So, the circumference of the field $= \frac{5280}{24} = 220\ \text{m}$

We know that circumference of the circle = $2\pi r$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 220$$

$\Rightarrow$ r = 35 m (radius of the field)

Also, the area of a circle = πr^2

$\Rightarrow$ Area of the field $= \frac{22}{7} \times 35 \times 35 = 3850\ \text{m}^2$

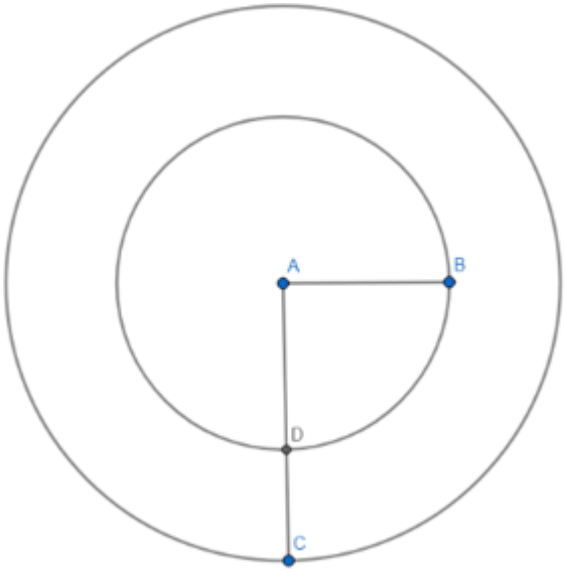
The field is to be ploughed at the rate of 0.50 per m^2.

Cost of ploughing the field = 3850×0.50 = Rs 1925

8. Question

The radius of a circular grass field is 35 m. There is a 7 m wide path all around it. Find the area of the path.

Answer



Given: Radius of the smaller circle AB = 35 m

Also, CD = 7 m

⇒ Radius of the larger circle AC = AD + CD = 35 + 7 = 42 m

Area of the path = Area of the larger circle – area of the smaller circle

∵The area of a circle = πr^2

⇒ Area of the path = πR^2 - πr^2

$$\Rightarrow \text{Area of the path} = \frac{22}{7}(R^2 - r^2)$$

$$\Rightarrow \text{Area of the path} = \frac{22}{7}(42^2 - 35^2)$$

Using (a+b)(a-b) = a^2 - b^2

$$\Rightarrow \text{Area of the path} = \frac{22}{7}(42 - 35)(42 + 35)$$

$$\Rightarrow \text{Area of the path} = \frac{22}{7}(7)(77)$$

⇒ Area of the path = 22× 77 = 1694 m^2

9. Question

The area enclosed between two concentric circles is:

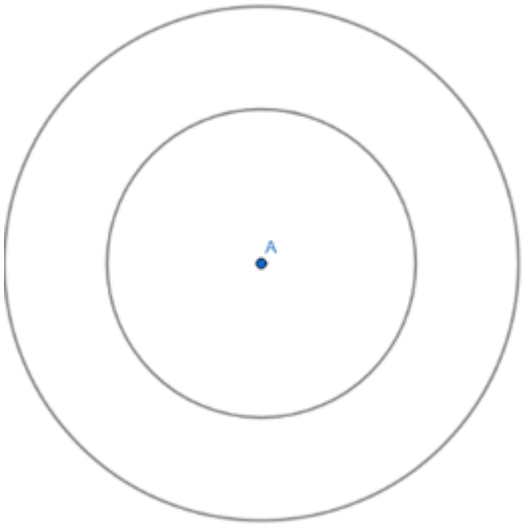
A. πr^2

B. $\pi(R + r)(R - r)$

C. $\pi(R^2 - r)$

D. None of these

Answer



Let the radius of the smaller circle be r and radius of the larger circle be R.

The area enclosed between two concentric circles = Area of the larger circle – area of the smaller circle

∵The area of a circle = πr^2

⇒ Required area = $\pi R^2 - \pi r^2$

⇒ Required area = $\pi (R^2 - r^2)$

Using $(a+b)(a-b) = a^2 - b^2$

⇒ Required area = $\pi (R+r)(R-r)$

10. Question

The radii of two concentric circles are 4 cm and 3 cm respectively. The area enclosed by the two circles is:

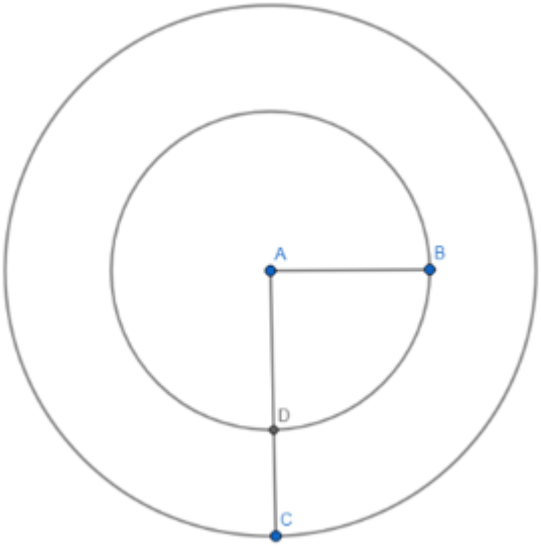
A. 22 cm^2

B. 12 cm^2

C. 32 cm^2

D. 18 cm^2

Answer



The radius of the smaller circle AB = 3 cm

And radius of the larger circle AC = 4 cm

The area enclosed between two concentric circles = Area of the larger circle – area of the smaller circle

∵The area of a circle = πr^2

⇒ Required area = $\pi R^2 - \pi r^2$

⇒ Required area = $\pi (R^2 - r^2)$

Using (a+b)(a-b) = $a^2 - b^2$

⇒ Required area = π (R+r)(R-r)

$$\Rightarrow \text{ Required area } = \frac{22}{7} \times (4+3)(4-3) = 22 \text{ cm}^2$$

Exercise 15.2

1. Question

In a circle of radius 7 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc.

Answer

Given: Radius of the circle = 7 cm and angle subtended by the arc = 60°

We know that the length of the arc $= \frac{\theta}{360^\circ} \times (2\pi r)$

$$\Rightarrow \text{Length of the arc} = \frac{60^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 7 = 7.3 \text{ cm}$$

2. Question

A sector of a circle of radius 10.5 cm contains an angle of 45°. Find the area of the minor sector. $\left(\pi = \frac{22}{7}\right)$

Answer

Given: Radius of the circle = 10.5 cm and angle subtended by the arc = 45°

We know that the area of the minor sector $= \frac{\theta}{360^\circ} \times (\pi r^2)$

$\Rightarrow$ Area of the minor sector $= \frac{45^\circ}{360^\circ} \times \frac{22}{7} \times 10.5 \times 10.5$

$\Rightarrow$ Area of the minor sector = 43.3125 cm^2

3. Question

The length of an arc of a circle of radius 7 cm is 12 cm. Find the area of the minor sector.

Answer

Given: Radius of the circle = 7 cm and length of an arc = 12 cm

We know that the length of the arc $= \frac{\theta}{360^\circ} \times (2\pi r)$

$$\Rightarrow \frac{\theta}{360^\circ} \times 2 \times \frac{22}{7} \times 7 = 12$$

$$\Rightarrow \theta = \frac{12 \times 360^\circ}{44} = 98.18^\circ$$

We know that the area of the minor sector $= \frac{\theta}{360^\circ} \times (\pi r^2)$

$\Rightarrow$ Area of the minor sector $= \frac{98.18^\circ}{360^\circ} \times \frac{22}{7} \times 7 \times 7$

$\Rightarrow$ Area of the minor sector = 42cm^2

4. Question

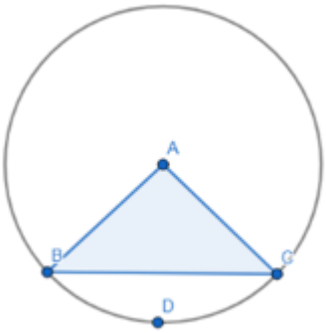
In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find:

(i) The length of the arc.

(ii) Area of the sector formed by the arc.

(iii) Area of the segment formed by the corresponding chord.

Answer



Given: Radius of the circle = 21 cm and angle subtended by the arc = 60°

(i) We know that the length of the arc $= \frac{\theta}{360^\circ} \times (2\pi r)$

$\Rightarrow$ Length of BDC $= \frac{60^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 21 = 22\text{cm}$

(ii) We know that the area of the minor sector $= \frac{\theta}{360^\circ} \times (\pi r^2)$

$\Rightarrow$ Area of ABDC $= \frac{60^\circ}{360^\circ} \times \frac{22}{7} \times 21 \times 21$

$\Rightarrow$ Area of ABDC = 231cm^2

(iii) Area of the segment BDC = area of sector ABDC – area of triangle ABC

In ΔABC,

∠A = 60°, AB = AC = 21 cm {radius of the circle}

$\Rightarrow$ ∠ABC = ∠ACB {angles opposite to equal sides are equal}

By the angle sum property of the triangle,

∠ABC + ∠ACB + ∠A = 180°

$\Rightarrow$ 2∠ABC = 180° - 60°

$\Rightarrow$ ∠ABC = 60°

Hence, ΔABC is an equilateral triangle.

Area of a equilateral triangle $= \frac{\sqrt{3}}{4}a^2$, where a is the side of it.

Area of ΔABC $= \frac{\sqrt{3}}{4}(21)^2$

$\Rightarrow$ Area of ΔABC = 190.95cm^2

∴ Area of the segment BDC = area of sector ABDC – area of triangle ABC

$\Rightarrow$ Area of the segment BDC = 231 – 190.95

⇒ Area of the segment BDC = $40.05cm^2$

5. Question

The length of the minute hand of a clock is 10.5 cm. Find area of the sector formed by the minute hand in 10 minutes. $\left(\pi = \frac{22}{7}\right)$

Answer

Let us consider clock as a circle with radius 10.5 cm.

Also, the 60 minutes of the clock constitute the 360° angle of the circle.

So, the angle formed by the minute hand in 10 minutes $= \frac{10}{60} \times 360° = 60°$

We know that the area of the minor sector $= \frac{\theta}{360°} \times (\pi r^2)$

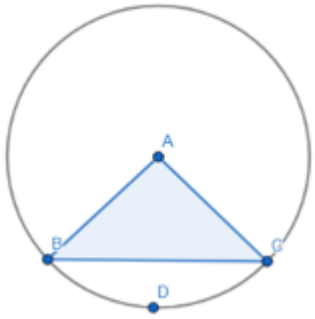
⇒ Area of the minor sector $= \frac{60°}{360°} \times \frac{22}{7} \times 10.5 \times 10.5$

⇒ Area of the minor sector = $57.75cm^2$

6. Question

A chord of a circle of radius 3.5 cm subtends an angle of 90° at the centre. Find the area of the minor segment of the circle. $\left(\pi = \frac{22}{7}\right)$

Answer



Given: Radius of the circle = 3.5 cm and angle subtended by the arc = 90°

Area of the segment BDC = area of sector ABDC – area of triangle ABC

We know that the area of the minor sector $= \frac{\theta}{360°} \times (\pi r^2)$

⇒ Area of ABDC $= \frac{90°}{360°} \times \frac{22}{7} \times 3.5 \times 3.5$

⇒ Area of ABDC = $9.625cm^2$

In ΔABC,

∠A = 90°, AB = AC = 3.5 cm {radius of the circle}

∵ ΔABC is a right angled triangle.

Area of $\Delta ABC = \frac{1}{2} \times \text{base} \times \text{height}$

$\Rightarrow$ Area of $\Delta ABC = \frac{1}{2} \times 3.5 \times 3.5$

$\Rightarrow$ Area of $\Delta ABC = 6.125 cm^2$

∴ Area of the segment BDC = area of sector ABDC – area of triangle ABC

$\Rightarrow$ Area of the segment BDC = 9.625 – 6.125

$\Rightarrow$ Area of the segment BDC = $3.5 cm^2$

7. Question

Find the area of a quadrant of a circle whose circumference is 22 cm.

Answer

Given that circumference of the circle = 22 cm

We know that circumference of the circle = 2πr

$$\Rightarrow 2 \times \frac{22}{7} \times r = 22$$

$\Rightarrow$ r = 3.5cm

Quadrant of a circle is the one fourth part of a circle.

Also, the area of a circle = πr^2

$$\Rightarrow \text{Area} = \frac{22}{7} \times 3.5 \times 3.5 = 38.5\ cm^2$$

$$\text{Area of a quadrant} = \frac{38.5}{4} = 9.625 cm^2$$

8. Question

The hour hand of a clock is 5 cm long. Find the area of the sector formed by the hour hand in 7 minutes.

Answer

Let us consider clock as a circle with radius 5 cm.

Also, the hour hand of the clock makes 360° when takes 12 hours.

So let us convert 7 minutes to degrees.

There are 12×60 minutes in 12 hours.

So, the angle formed by the hour in 7 minutes $= \frac{7}{12\times60} \times 360° = 3.49°$

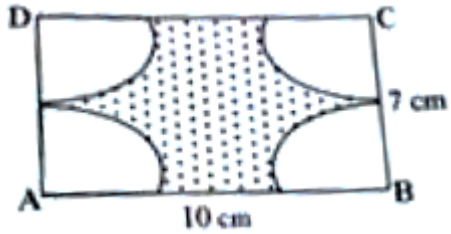
We know that the area of the minor sector $= \frac{\theta}{360°} \times (\pi r^2)$

$\Rightarrow$ Area of the minor sector $= \frac{3.49°}{360°} \times \frac{22}{7} \times 5 \times 5$

$\Rightarrow$ Area of the minor sector = 0.7638cm^2

9. Question

In figure, ABCD is a rectangle. The side AB = 10 cm and BC = 7 cm. From each vertex of the rectangle, are of radii 3.5 cm are drawn. Find the shaded region. $\left(\pi = \frac{22}{7}\right)$



Answer

Given: AB = 10 cm, BC = 7 cm, Radius of the quadrants = 3.5 cm

In the given figure, the four quadrants together form a circle of radius 3.5 cm

∴ Area of the shaded region = Area of the rectangle – Area of the circle formed by the 4 quadrants

Area of rectangle = Length × breadth = 10× 7 = 70 cm^2

Area of a circle = πr^2

$\Rightarrow$ Area $= \frac{22}{7} \times 3.5 \times 3.5 = 38.5$ cm^2

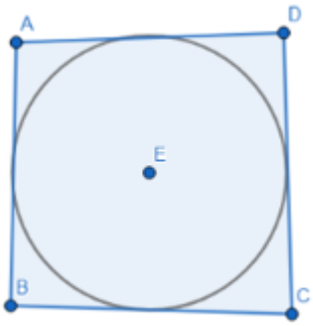
Area of the shaded region = 70 – 38.5 = 31.5 cm^2

Exercise 15.3

1. Question

Find the circumference of the incircle of a square of side 14 cm

Answer



Let ABCD be the square with side 14 cm.

⇒ BC = 14 cm

Let the circle centered at E be the incircle of the ABCD.

BC = diameter of the circle = 14 cm

⇒ Radius of the circle = 7 cm

Given that radius of the circle = 7 cm

We know that circumference of the circle = 2πr

⇒ Circumference = $2 \times \frac{22}{7} \times 7 = 44$ cm

2. Question

Difference between the circumference and radius of a circle is 74 cm. Find the area of the circle.

Answer

Given that difference between the circumference of the circle and radius of it = 74 cm

We know that circumference of the circle = 2πr

⇒ 2πr – r = 74

$$\Rightarrow 2 \times \frac{22}{7} r - r = 74$$

$$\Rightarrow r(2 \times \frac{22}{7} - 1) = 74$$

$$\Rightarrow r \times \frac{37}{7}$$

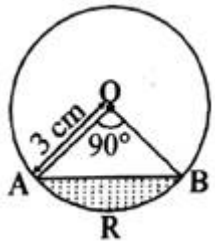
$$\Rightarrow r = \frac{74 \times 7}{37} = 14 \text{ cm}$$

Area of a circle = πr^2

$\Rightarrow$ Area $= \frac{22}{7} \times 14 \times 14 = 616\ cm^2$

3. Question

In the given figure, O is the centre of the circle. ∠AOB = 90° and OA = 3 cm. Find the area of the shaded region.



Answer

Given: Radius of the circle = 3 cm and angle subtended by the arc = 90°

Area of the segment ARB = area of sector OARB – area of triangle OAB

We know that the area of the minor sector $= \frac{\theta}{360°} \times (\pi r^2)$

$\Rightarrow$ Area of ABDC $= \frac{90°}{360°} \times \frac{22}{7} \times 3 \times 3$

$\Rightarrow$ Area of ABDC = $7.071428 cm^2$

In ΔABC,

∠A = 90°, AB = AC = 3 cm {radius of the circle}

∵ ΔABC is a right angled triangle.

Area of ΔABC $= \frac{1}{2} \times$ base $\times$ height

$\Rightarrow$ Area of ΔABC $= \frac{1}{2} \times 3 \times 3$

$\Rightarrow$ Area of ΔABC = $4.5 cm^2$

∴ Area of the segment BDC = area of sector ABDC – area of triangle ABC

$\Rightarrow$ Area of the segment BDC = 7.071428 – 4.5

$\Rightarrow$ Area of the segment BDC = $2.57 cm^2$

4. Question

The circumference of a circle is equal to the perimeter of a square. Find the ratio of their areas.

Answer

Given the circumference of a circle is equal to the perimeter of a square. We know that circumference of the circle = 2πr and the perimeter of a square = 4× length of the side.

$\Rightarrow 2\pi r = 4 \times side$

$\Rightarrow \frac{r}{side} = \frac{2}{\pi}$ ... (i)

We know that area of the square = $(Side)^2$

Also, the area of a circle = πr^2

$\Rightarrow$ Ratio of their areas $= \frac{\pi r^2}{side^2}$

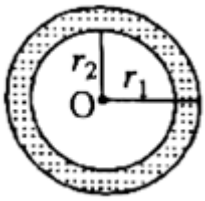
$\Rightarrow$ Ratio of their areas $= \pi \times \left(\frac{2}{\pi}\right)^2$

$\Rightarrow$ Ratio of their areas $= \frac{4}{\pi}$

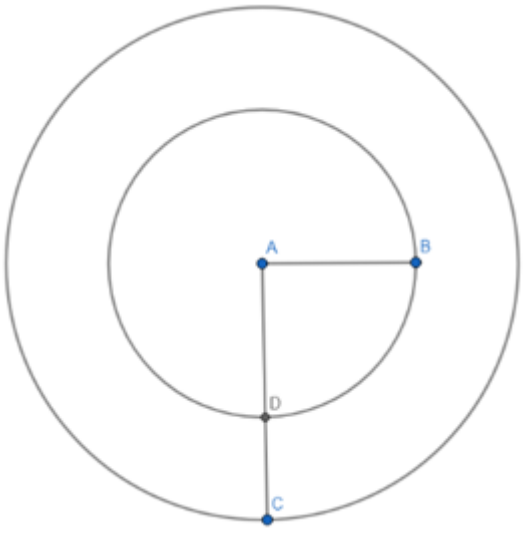
$\Rightarrow$ Ratio of their areas $= \frac{4 \times 7}{22} = \frac{14}{11}$

5. Question

The radius of a circular park is 3.5 m. A 1.4 m wide footpath is made all round the circular park. Find the area of the footpath.



Answer



Given: Radius of the smaller circle AB = 3.5 m

Also, CD = 1.4 m

⇒ Radius of the larger circle AC = AD + CD = 3.5 + 1.4 = 4.9 m

Area of the path = Area of the larger circle – area of the smaller circle

∵The area of a circle = πr^2

⇒ Area of the path = $\pi R^2 - \pi r^2$

⇒ Area of the path = $\frac{22}{7}(R^2 - r^2)$

⇒ Area of the path = $\frac{22}{7}(4.9^2 - 3.5^2)$

Using (a+b)(a-b) = $a^2 - b^2$

⇒ Area of the path = $\frac{22}{7}(4.9 - 3.5)(4.9 + 3.5)$

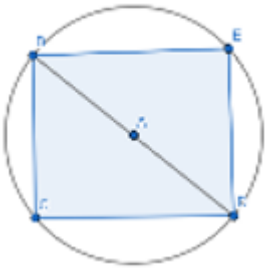
⇒ Area of the path = $\frac{22}{7}(1.4)(8.4)$

⇒ Area of the path = 36.96 m^2

6. Question

Find the area of the largest square that can be drawn inside a circle of radius 8 cm.

Answer



Given: Radius of the circle = 8 cm

Diameter of the circle = 16 cm

For the largest square inscribed in it i.e. BCDE,

Diagonal of the square = diameter of the circle

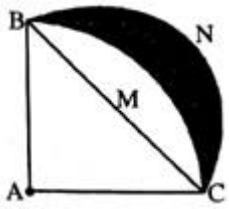
⇒ BD = 16 cm

Area of a square = $\frac{\text{Diagonal}^2}{2}$

⇒ Area of BCDE = $\frac{16 \times 16}{2} = 128\ cm^2$

7. Question

In the given figure, ABMC is a quadrant of a circle of radius 14 cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.



Answer

Given: ABMC is a quadrant of radius 14 cm.

In ΔABC,

∠A = 90°, AB = AC = 14 cm

By Pythagoras theorem,

$BC^2 = AB^2 + AC^2$

$\Rightarrow BC^2 = 2\times 14\times 14$

$\Rightarrow BC = 14\sqrt{2}$ cm

Now, Area of $\Delta ABC = \frac{1}{2} \times \text{base} \times \text{height}$

$\Rightarrow$ Area of $\Delta ABC = \frac{1}{2} \times 14 \times 14$

$\Rightarrow$ Area of $\Delta ABC = 98cm^2$

We know that the area of the minor sector $= \frac{\theta}{360^\circ} \times (\pi r^2)$

$\Rightarrow$ Area of $ABMC = \frac{90^\circ}{360^\circ} \times \frac{22}{7} \times 14 \times 14$

$\Rightarrow$ Area of $ABMC = 154cm^2$

So, area of ABMC = area of ΔABC + area of BCM

$\Rightarrow$ Area of BCM = area of ABMC - area of ΔABC

$\Rightarrow$ Area of $BCM = 154 - 98 = 56cm^2$

Also, we have a semicircle made at BC in the figure.

Diameter of the semicircle = BC = $14\sqrt{2}$ cm

$\Rightarrow$ Radius of the semicircle = $7\sqrt{2}$ cm

Area of semicircle $= \pi\frac{r^2}{2}$

$\Rightarrow$ Area of semicircular plot $= \frac{22}{7\times2} \times 7\sqrt{2} \times 7\sqrt{2}$

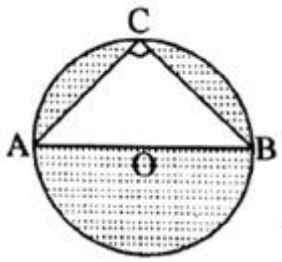
$\Rightarrow$ Area of semicircular plot = 154 cm^2

Area of the shaded region = Area of the semicircle - Area of BCM

$\Rightarrow$ Area of the shaded region = 154 – 56 = 98 cm^2

8. Question

In the given figure, AB is a diameter, AC = 6 cm, BC = 8 cm. Find the shaded region.



Answer

Given:

In ΔABC,

AC = 6 cm, BC = 8 cm

Also, ∠C = 90° because angle subtended by the diameter is 90° and AB is the diameter.

By Pythagoras theorem,

$BA^2 = CB^2 + AC^2$

$\Rightarrow BC^2 = 36 + 64$

$\Rightarrow$ BC = 10 cm

$$\text{Area of } \Delta ABC = \frac{1}{2} \times \text{base} \times \text{height}$$

$$\Rightarrow \text{Area of } \Delta ABC = \frac{1}{2} \times 6 \times 8$$

$\Rightarrow$ Area of ΔABC = 24 cm^2

Radius of the circle = 5 cm

Area of a circle = πr^2

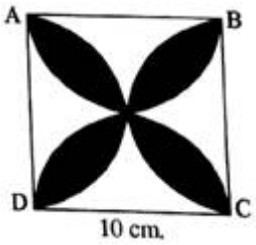
$$\Rightarrow \text{Area} = \frac{22}{7} \times 5 \times 5 = 78.57\text{cm}^2$$

Area of the shaded region = Area of circle –Area of the triangle

⇒ Area of the shaded region = 78.57 -24 = 54.57 cm^2

9. Question

Find the area of the shaded design in the figure, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter (use π = 3.14).



Answer

Given side of the square ABCD = 10 cm

Area of the square = side × side

⇒ Area of ABCD = 10 × 10 = 100 cm^2

Also given that semicircles are drawn with each side of the square as diameter

Diameter = 10 cm

Radius = 5 cm

Let us mark the four unshaded areas as I, II, III and IV.

Area of I + Area III

= Area of square - Area of two semi-circles

$$= 100 - 2 \times \frac{1}{2}\pi \times 25 = 100 - 3.14 \times 25$$

= 21.5 cm^2

Similarly, Area of II + Area of IV = 21.5 cm^2

So, area of shaded region = ar of ABCD - ar (I + II + III + IV)

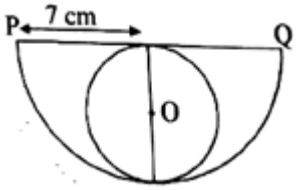
= (100 – 2 × 21.5) cm^2

= 100 - 43

= 57 cm^2

10. Question

In the given figure, radius of the semicircle is 7 cm. Find the area of the circle drawn inside the semicircle.



Answer

In the given figure the radius of the semicircle = 7 cm

The diameter of the circle inscribed in the semicircle = 7 cm

⇒ Radius of the circle = 3.5 cm

Area of a circle = πr^2

$$\Rightarrow \text{Area} = \frac{22}{7} \times 3.5 \times 3.5 = 38.5 \text{ cm}^2$$

11. Question

If the sum of circumferences of two circles of radii R_1 and R_2 is equal to the circumference of a circle of radius R, then which of the following choices is correct?

A. $R_1 + R_2 = R$

B. $R_1 + R_2 > R$

C. $R_1 + R_2 < R$

D. Nothing can be said with certainty.

Answer

Given: The sum of circumferences of two circles of radii R_1 and R_2 is equal to the circumference of a circle of radius R.

We know that circumference of the circle = $2\pi r$

$\Rightarrow 2\pi R_1 + 2\pi R_2 = 2\pi R$

$\Rightarrow 2\pi (R_1 + R_2) = R$

$\Rightarrow R_1 + R_2 = R$

12. Question

The circumference of the incircle of a square of side 14 cm is—

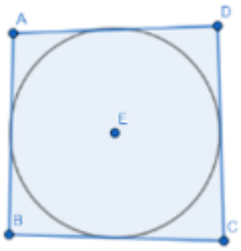
A. 22 cm

B. 44 cm

C. 33 cm

D. 55 cm

Answer



Let ABCD be the square with side 14 cm.

⇒ BC = 14 cm

Let the circle centered at E be the incircle of the ABCD.

BC = diameter of the circle = 14 cm

⇒ Radius of the circle = 7 cm

Given that radius of the circle = 7 cm

We know that circumference of the circle = 2πr

$$\Rightarrow \text{Circumference} = 2 \times \frac{22}{7} \times 7 = 44 \text{ cm}$$