



Exercise 20F

Q1

Answer :

(i) Given:

$$r = 21 \text{ cm}$$

$$\begin{aligned}\therefore \text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 21 \times 21\right) \text{ cm}^2 = (22 \times 3 \times 21) \text{ cm}^2 = 1386 \text{ cm}^2\end{aligned}$$

(ii) Given:

$$r = 3.5 \text{ m}$$

$$\begin{aligned}\text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 3.5 \times 3.5\right) \text{ m}^2 = (22 \times 0.5 \times 3.5) \text{ m}^2 = 38.5 \text{ m}^2\end{aligned}$$

Q2

Answer :

(i) Given:

$$d = 28 \text{ cm} \Rightarrow r = \left(\frac{d}{2}\right) = \left(\frac{28}{2}\right) \text{ cm} = 14 \text{ cm}$$

$$\begin{aligned}\text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 14 \times 14\right) \text{ cm}^2 = (22 \times 2 \times 14) \text{ cm}^2 = 616 \text{ cm}^2\end{aligned}$$

(ii) Given:

$$r = 1.4 \text{ m} \Rightarrow r = \left(\frac{d}{2}\right) = \left(\frac{1.4}{2}\right) \text{ m} = 0.7 \text{ m}$$

$$\begin{aligned}\text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 0.7 \times 0.7\right) \text{ m}^2 = (22 \times 0.1 \times 0.7) \text{ m}^2 = 1.54 \text{ m}^2\end{aligned}$$

Q3

Answer :

Let the radius of the circle be r cm.

Circumference = $(2\pi r)$ cm

$$\therefore (2\pi r) = 264$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 264$$

$$\Rightarrow r = \left(\frac{264 \times 7}{2 \times 22}\right) = 42$$

$$\begin{aligned}\therefore \text{Area of the circle} &= \pi r^2 \\ &= \left(\frac{22}{7} \times 42 \times 42\right) \text{ cm}^2 \\ &= 5544 \text{ cm}^2\end{aligned}$$

Q4

Answer :

Let the radius of the circle be r m.

Then, its circumference will be $(2\pi r)$ m.

$$\therefore (2\pi r) = 35.2$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 35.2$$

$$\Rightarrow r = \left(\frac{35.2 \times 7}{2 \times 22}\right) = 5.6$$

$$\begin{aligned}\therefore \text{Area of the circle} &= \pi r^2 \\ &= \left(\frac{22}{7} \times 5.6 \times 5.6\right) \text{ m}^2 = 98.56 \text{ m}^2\end{aligned}$$

Q5

Answer :

Let the radius of the circle be r cm.

Then, its area will be πr^2 cm².

$$\therefore \pi r^2 = 616$$

$$\Rightarrow \left(\frac{22}{7} \times r \times r \right) = 616$$

$$\Rightarrow r^2 = \left(\frac{616 \times 7}{22} \right) = 196$$

$$\Rightarrow r = \sqrt{196} = 14$$

$$\begin{aligned} \Rightarrow \text{Circumference of the circle} &= (2\pi r) \text{ cm} \\ &= \left(2 \times \frac{22}{7} \times 14 \right) \text{ cm} = 88 \text{ cm} \end{aligned}$$

Q6

Answer :

Let the radius of the circle be r m.

Then, area = πr^2 m²

$$\therefore \pi r^2 = 1386$$

$$\Rightarrow \left(\frac{22}{7} \times r \times r \right) = 1386$$

$$\Rightarrow r^2 = \left(\frac{1386 \times 7}{22} \right) = 441$$

$$\Rightarrow r = \sqrt{441} = 21$$

$$\begin{aligned} \Rightarrow \text{Circumference of the circle} &= (2\pi r) \text{ m} \\ &= \left(2 \times \frac{22}{7} \times 21 \right) \text{ m} = 132 \text{ m} \end{aligned}$$

Q7

Answer :

Let r_1 and r_2 be the radii of the two given circles and A_1 and A_2 be their respective areas.

$$\frac{r_1}{r_2} = \frac{4}{5}$$

$$\therefore \frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2} = \frac{r_1^2}{r_2^2} = \left(\frac{r_1}{r_2} \right)^2 = \left(\frac{4}{5} \right)^2 = \frac{16}{25}$$

Hence, the ratio of the areas of the given circles is 16:25.

Q8

Answer :

If the horse is tied to a pole, then the pole will be the central point and the area over which the horse will graze will be a circle. The string by which the horse is tied will be the radius of the circle.

Thus,

Radius of the circle (r) = Length of the string = 21 m

Now, area of the circle = $\pi r^2 = \left(\frac{22}{7} \times 21 \times 21\right) \text{ m}^2 = 1386 \text{ m}^2$

\therefore Required area = 1386 m^2

Q9

Answer :

Let a be one side of the square.

Area of the square = 121 cm^2 (given)

$$\Rightarrow a^2 = 121$$

$$\Rightarrow a = 11 \text{ cm (since } 11 \times 11 = 121)$$

Perimeter of the square = 4 \times side = $4a = (4 \times 11) \text{ cm} = 44 \text{ cm}$

Length of the wire = Perimeter of the square
= 44 cm

The wire is bent in the form of a circle.

Circumference of a circle = Length of the wire

\therefore Circumference of a circle = 44 cm

$$\Rightarrow 2\pi r = 44$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 44$$

$$\Rightarrow r = \left(\frac{44 \times 7}{2 \times 22}\right) = 7 \text{ cm}$$

\therefore Area of the circle = πr^2

$$= \left(\frac{22}{7} \times 7 \times 7\right) \text{ cm}^2$$

$$= 154 \text{ cm}^2$$

Q10

Answer :

It is given that the radius of the circle is 28 cm.

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