Areas Related to Circles Ex 15.1 Q7

Answer :

It is given that a horse is tethered to one corner of a rectangular field (40 m × 36 m) by a 14 m long rope.

Let r m be the radius of a circle. Then area A of circle is

$$A = \pi r^2 \text{ cm}^2$$
$$= \frac{22}{7} \times 14 \times 14 \text{ cm}^2$$
$$= 616 \text{ cm}^2$$

Since the horse can graze inside the rectangular field only, the required area is quadrant of circle. So,

$$\text{The required area } = \frac{A}{4}$$
$$= \frac{616}{4} \text{ cm}^2$$
$$= \boxed{154 \text{ cm}^2}$$

Hence the horse can graze $\boxed{154 \text{ cm}^2}$ area.

Areas Related to Circles Ex 15.1 Q8

Answer :

The length and width of rectangle *ABCD* is given by $AB = 40$ cm and $AD = 28$ cm respectively.

Now, we will find the area of rectangle.

$$\text{Area of rectangle} = l \times w$$
$$= 40 \times 28$$
$$= 1120 \text{ cm}^2$$

It is given that a semicircular portion with BC as diameter is cutoff from rectangle. So,

$$\text{radius of semicircle } = \frac{BC}{2}$$
$$= \frac{28}{2}$$
$$= 14 \text{ cm}$$

Now, $\text{The area of semicircle} = \frac{1}{2}\pi r^2$

Substituting the value of *r*,

$$\text{The area of semicircle } = \frac{1}{2} \times \frac{22}{7} \times 14 \times 14$$
$$= 308 \text{ cm}^2$$

The area A of remaining paper is

$$A = \text{Area of rectangle - Area of semicircle}$$
$$= 1120 - 308$$
$$= \boxed{812 \text{ cm}^2}$$

Thus, the area of remaining paper is $\boxed{812 \text{ cm}^2}$.

Areas Related to Circles Ex 15.1 Q9

Answer :

Let the radius of two circles be r_1 cm and r_2 cm respectively. Then their circumferences are $C_1 = 2\pi r_1$ cm and $C_2 = 2\pi r_2$ cm respectively and their areas are $A_1 = \pi r_1^2$ cm^2 and $A_2 = \pi r_2^2$ cm^2 respectively.

It is given that,

$$\frac{C_1}{C_2} = \frac{2}{3}$$

$$\frac{2\pi r_1}{2\pi r_2} = \frac{2}{3}$$

$$\frac{r_1}{r_2} = \frac{2}{3}$$

Now we will calculate the ratio of their areas,

$$\frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2}$$

$$= \frac{r_1^2}{r_2^2}$$

$$= \left(\frac{r_1}{r_2}\right)^2$$

Substituting the value of $\frac{r_1}{r_2}$,

$$\frac{A_1}{A_2} = \left(\frac{2}{3}\right)^2$$

$$= \boxed{\frac{4}{9}}$$

Hence the ratio of their Areas is $\boxed{4:9}$.

*********** END **********