Exercise 20(C)

1. The diameter of a circle is 28 cm. Find its:
(i) Circumference
(ii) Area.
Solution:

Let's assume r to be the radius of the circle
(i) Given, diameter = 28 cm
So, radius = 28/2 = 14 cm
Now,
Circumference = $2\pi r$
$= 2 \times 22/7 \times 14$
$= 88$ cm

(ii) The area of the circle is given by
Area = πr^2
$= 22/7 \times 14^2$
$= 22/7 \times 14 \times 14$
$= 44 \times 14$
$= 616\ cm^2$

2. The circumference of a circular field is 308 m. Find is:
(i) Radius
(ii) Area.
Solution:

Let's assume r to the radius of the circular field
(i) Given,
The circumference of the circular field = 308 m
$2\pi r = 308$
$r = 308/2\pi$
$= 154/\pi$
$= (154 \times 7)/22$
$= 49$ m
Hence, the radius of the circular field is 49 m

(ii) Now, the area of the circular field is calculated as
Area = πr^2
$= 22/7 \times 49^2$
$= 22/7 \times 49 \times 49$
$= 22 \times 7 \times 49$
$= 7546\ cm^2$

3. The sum of the circumference and diameter of a circle is 116 cm. Find its radius.
Solution:

Let's consider r to be the radius of the circle
Then, according to the question, we have
$2\pi r + 2r = 116$
$2r(\pi + 1) = 116$
$r = 116/2(\pi + 1)$
$= 88/(22/7 + 1)$
$= 14$ cm

Hence, the radius of the circle is 14 cm

4. The radii of two circles are 25 cm and 18 cm. Find the radius of the circle which has circumference equal to the sum of circumferences of these two circles.
Solution:

We have,
The radii of two circles are 25 cm and 18 cm
Now, the circumference of the first circle is
$S_1 = 2\pi \times 25$
$= 50\pi$ cm
And,
The circumference of the second circle is
$S_s = 2\pi \times 18$
$= 36\pi$ cm

According to the question,
Let's assume R to be the radius of the resulting circle
So,
$2\pi R = 50\pi + 36\pi$
$2\pi R = \pi(50 + 36)$
Dividing by π on both sides, we get
$2R = 86$
$R = 43$ cm

Therefore, the radius of the circle which has circumference equal to the sum of circumferences of the given two circles is 43 cm

5. The radii of two circles are 48 cm and 13 cm. Find the area of the circle which has its circumference equal to the difference of the circumferences of the given two circles.
Solution:

We have,
The radii of two circles are 48 cm and 13 cm
Now, the circumference of the first circle is
$S_1 = 2\pi \times 48$
$= 96\pi$ cm
And,

The circumference of the second circle is
$S_s = 2\pi \times 13$
$= 26\pi$ cm

According to the question,
Let's assume R to be the radius of the resulting circle
So,
$2\pi R = 96\pi - 26\pi$
$2\pi R = \pi(96 - 26)$
Dividing by π on both sides, we get
$2R = 70$
$R = 35$ cm

Then, the area of the circle is given by
$A = \pi R^2$
$= \pi \times 35^2$
$= 22/7 \times 35 \times 35$
$= 22 \times 5 \times 35$
$= 3850$ cm^2
Therefore, the area of the required circle is 3850 cm^2

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