Chapter – 10
Practical Geometry
Exercise 11.3

1. Find the circumference of the circles with the following radius:
$\left(\text{Take } \pi = \frac{22}{7}\right)$

(a) 14 cm (b) 28 mm (c) 21 cm

Answer:

(a) It is given in the question that,

Radius of the circle = 14 cm

We know that,

Circumference of the circle = 2πr

= 2 × π × 14

= 2 × (22/7) × 14

= 2 × (22/7) × 2

= 88 cm

(b) It is given in the question that,

Radius of the circle = 28 mm

We know that,

Circumference of the circle = 2πr

= 2 × π × 28mm

= 2 × (22/7) × 28mm

= 2 × (22) × 4

=176 mm

(c) It is given in the question that,

Radius of the circle = 21 cm

We know that,

Circumference of the circle = $2\pi r$

$= 2 \times \pi \times 21$ cm

$= 2 \times (22/7) \times 21$ cm

$= 2 \times (22) \times 3$ cm

$= 132$ cm

2. Find the area of the following circles, given that : $\left(\text{Take } \pi = \frac{22}{7}\right)$

(a) Radius = 14 mm

(b) Diameter = 49 m

(c) Radius = 5 cm

Answer:

(a) It is given in the question that,

Radius of the circle = 14 mm

We know that,

Area of the circle = πr^2

$\therefore$ Area = $\frac{22}{7} \times 14 \times 14$

$= 22 \times 2 \times 14$

$= 616$ mm^2

(b) It is given in the question that,

Diameter of the circle = 49 m

Radius of the circle = $\frac{49}{2}$ m

We know that,

Area of the circle = πr^2

$\therefore$ Area $= \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2}$

$= 1886.5\ m^2$

(c) It is given in the question that,

Radius of the circle = 5 cm

We know that,

Area of the circle $= \pi r^2$

$\therefore$ Area $= \frac{22}{7} \times 5 \times 5$

$= 78.57\ cm^2$

3. If the circumference of a circular sheet is 154 m, find its radius. Also, find the area of the sheet.
$\left(\text{Take } \pi = \frac{22}{7}\right)$

Answer:

It is given in the question that,

Circumference of a circular sheet = 154 m

We know that,

Circumference of the circle = 2r

$\therefore 2 \times \frac{22}{7} \times r = 154$

Thus,

$r = 154 \times \frac{7}{44}$

$= \frac{49}{2}$

$= 24.5$ m

We know that,

Area of the circle = πr^2

$\therefore$ Area = $\frac{22}{7} \times 24.5 \times 24.5$

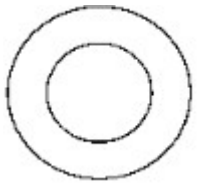
$= \frac{22}{7} \times 24.5 \times 24.5$

$= 22 \times 85.75$

$= 1886.5\ m^2$

Hence the radius is 24.5 m and area is 1886.5 m^2.

4. A gardener wants to fence a circular garden of diameter 21 m. Find the length of the rope he needs to purchase, if he makes 2 rounds of fence. Also find the cost of the rope, if it costs Rs. 4 per metre. $\left(\text{Take } \pi = \frac{22}{7}\right)$



Answer:

It is given in the question that,

Diameter of circular garden = 21 m

$\therefore$ Radius of circular garden = Diameter/2 = 21/2 m

Now, the length of rope required for fencing the garden will be equal to the two times the circumference of the garden, because the fencing is done in 2 rounds.

And, One round of circle = the circumference of the circle = $2\pi r$

$= 2 \times \frac{22}{7} \times \frac{21}{2}$

$= 22 \times 3$

$= 66$ m

Now, the gardener takes 2 rounds of fence.

⇒ Total length required = 2 × 66 = 132 m

Also, it is given that:

Cost of 1 m of rope = Rs 4

⇒ Cost of 132 m of rope = 4 × 132= Rs 528

∴ the total cost of the rope will be Rs 528

5. From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet.

Answer:

It is given in the question that,

Outer radius of circular sheet = 4 cm

Inner radius of circular sheet = 3 cm

In the question, we have to find out the remaining area of sheet

∴ Remaining area of sheet = Outer area – Inner area

We know that,

Area of the circle = πr^2

∴ Remaining area of sheet = 3.14 × 4 × 4 – 3.14 × 3 × 3

= 3.14 × 16 – 3.14 × 9

= 50.24 – 28.26

= 21.98 cm^2

Hence,

Remaining area of the sheet = 21.98 cm^2

6. Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one metre of the lace costs Rs 15.
(Take $\pi = 3.14$)

Answer:

It is given in the question that,

Diameter of table cover = 1.5 m

∴ The radius of circular cover = 1.5/2

We know that,

Circumference of the circle = $2\pi r$

∴ Circumference $= 2 \times 3.14 \times \frac{1.5}{2}$

$= 3.14 \times 1.5$

= 4.71 m

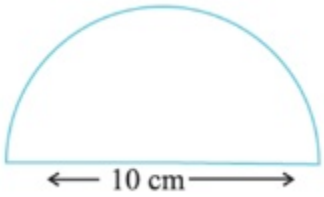
Also, it is given in the question that:

Cost of 1 m of lace = Rs 15

∴ Cost of 4.71 m of lace = 4.71×15

= Rs 70.65

7. Find the perimeter of the adjoining figure, which is a semicircle including its diameter.



Answer:

We know that perimeter of a complete circle = $2\pi r$, where r is the radius of the circle.

So, perimeter of semi-circle = πr

Given: Diameter of semi-circle = 10 cm

$\text{Radius} = \frac{\text{Diameter}}{2}$

Therefore, radius of the given circle = 5 cm

Now, Perimeter of semi-circle = Perimeter of semi circular part + Length of AB $= 5\pi + 10 = (3.14 \times 5) + 10$

$= \left(\frac{314}{100} \times 5\right) + 10$

$$= \left(\frac{314}{\cancel{100}_{20}} \times \cancel{5}^{1}\right) + 10$$

$$= \frac{\cancel{314}^{157}}{\cancel{20}_{10}} + 10$$

= 15.7 + 10= 25. 7 cm. Total perimeter = 25.7 cm

8. No solution available N//A

9. Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the square?
$\left(\text{Take } \pi = \frac{22}{7}\right)$

Answer:

It is given in the question that,

Length of wire = Circumference of circle = 44 cm

We know that,

Circumference of the circle = $2\pi r$

Thus,

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

$44 = \frac{44}{7} \times r$

$\therefore r = 7$ cm

Radius = 7 cm.

We know that,

Area of the circle = πr^2

$\therefore$ Area = $\frac{22}{7} \times 7 \times 7$

$= 22 \times 7$

$= 154$ cm^2

Now, according to the question

If the wire is bent into a square then the length of each side of the square would be:

44/4 = 11 cm

We know that,

Area of square = $(\text{Side})^2$

Area = $(11)^2$

$= 11 \times 11$

$= 121$ cm^2

Hence, the Area of Circle is greater than Area of Square

The circle encloses more area as compared to the square.

10. From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed (as shown in figure). Find the area of the remaining sheet $\left(\text{Take } \pi = \frac{22}{7}\right)$

Answer:

It is given in the question that,

Radius of bigger circle = 14 cm

Area of the circle = πr^2

$\therefore$ Area of bigger circle = $\frac{22}{7} \times 14 \times 14$

$= 22 \times 2 \times 14$

$= 44 \times 14$

$= 616 \text{ cm}^2$

Also, it is given that:

Radius of two small circles = 3.5 cm

Area of the circle = πr^2

$\therefore$ Area of 2 small circles $= 2 \times \frac{22}{7} \times 3.5 \times 3.5$

$= 44 \times 0.5 \times 3.5$

$= 22 \times 3.5$

$= 77\ \text{cm}^2$

Length of rectangle = 3 cm

Breadth of rectangle = 1 cm

Area of rectangle = Length × Breadth

$\therefore$ Area of rectangle $= 3 \times 1$

$= 3\ \text{cm}^2$

Hence,

Remaining area of sheet = Area of bigger circle – Area of 2 small circles – Area of rectangle

$= 616 - 77 - 3$

$= 616 - 80$

$= 536\ \text{cm}^2$

11. A circle of radius 2 cm is cut out from a square piece of an aluminium sheet of side 6 cm. What is the area of the left over aluminium sheet?
$\left(\text{Take } \pi = \frac{22}{7}\right)$

Answer:

It is given in the question that,

Side of square = 6 cm

Area of square $= (\text{Side})^2$

$\therefore$ Area of square shaped sheet $= (6)^2$

$= 36\ cm^2$

It is also given in the question that,

Radius of circle = 2 cm

As we know,

Area of the circle = πr^2

$\therefore$ Area = $3.14 \times 2 \times 2$

$= 3.14 \times 4$

$= 12.56\ cm^2$

Hence,

The remaining area of the sheet = 36 – 12.56

$$\begin{array}{r} {\scriptstyle 5\ \ 9\ 10} \\ 3\not{6}.\not{0}\ \not{0} \\ -\underline{12.\ 5\ \ 6} \\ 23.\ 4\ \ 4 \end{array}$$

$= 23.44\ cm^2$

12. The circumference of a circle is 31.4 cm. Find the radius and the area of the circle. (Take $\pi = 3.14$)

Answer:

It is given in the question that,

Circumference of circle = 31.4 cm

We know that,

Circumference of the circle = $2\pi r$

$\therefore 31.4 = 2 \times 3.14 \times r$

$31.4 = 6.28 \times r$

$\Rightarrow r = 31.4/6.28$

$\Rightarrow r = 5$ cm

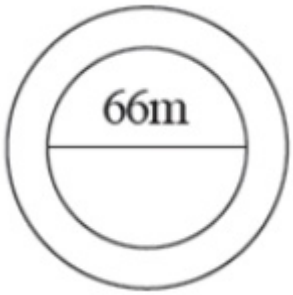
Area of the circle $= \pi r^2$

$= 3.14 \times 5 \times 5$

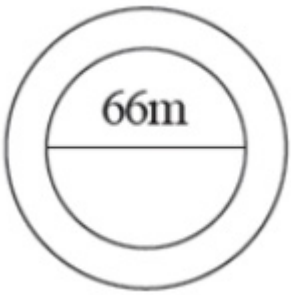
$= 3.14 \times 25$

$= 78.5 \text{ cm}^2$

13. A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? (Take $\pi = 3.14$)



Answer:



It is given in the question that,

Diameter of flower bed = 66 m

Radius of flower bed $= \frac{66}{2} = 33$ m

Radius of flower bed and path together = 33 + 4 = 37 m

We know that,

Area of the circle = πr^2

$\therefore$ Area of flower bed and path together = $3.14 \times 37 \times 37$

= $4298.66\ m^2$

Area of flower bed = $3.14 \times 33 \times 33$

= $3419.46\ m^2$

Hence,

Area of path = Area of flower bed and path together - Area of flower bed

= $4298.66 - 3419.46$

= $879.20\ m^2$

14. A circular flower garden has an area of about $314\ m^2$. A sprinkler at the center of the garden can cover an area that has a radius of 12 m. Will the sprinkler water the entire garden? (Take $\pi = 3.14$)

Answer:

It is given in the question that,

Area of circular flower garden = $314\ m^2$

We know that,

Area of the circle = πr^2

$314 = 3.14 \times r^2$

$r^2 = 314/3.14$

$r^2 = 100$

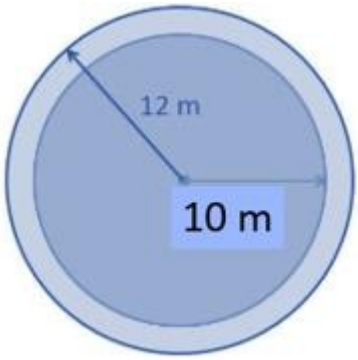
$r = 10$ m

Since, the radius of garden is less than radius of sprinkle

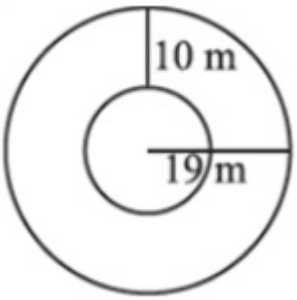
i.e. Area of the garden will be less than the area of sprinkle.

So, the sprinkler can easily water the whole garden.

The figure will be:



15. Find the circumference of the inner and the outer circles, shown in the adjoining figure.
(Take $\pi = 3.14$)



Answer:

It is given in the question that,

Radius of outer circle = 19 m

We know that,

Circumference of the circle = $2\pi r$

$= 2 \times 3.14 \times 19$

$= 38 \times 3.14$

$= 119.32$ m

Radius of inner circle $= 19 - 10 = 9$ m

As we know that,

Circumference of the circle $= 2\pi r$

$= 2 \times 3.14 \times 9$

$= 18 \times 3.14$

$= 56.52$

Hence,

Circumference of outer circle = 119.32 m

Circumference of inner circle = 56.52 m

16. How many times a wheel of radius 28 cm must rotate to go 352 m?

$\left(\text{Take } \pi = \frac{22}{7}\right)$

Answer:

It is given in the question that,

Total distance to be covered by wheel = 352 m

= 35200 cm

Radius of wheel = 28 cm

Circumference of the circle $= 2\pi r$

$= 2 \times \frac{22}{7} \times 28$

$= 2 \times 22 \times 4$

$= 176$ cm

When a wheel rotates completely it covers a certain distance.

Hence it can be used to find the distance covered by a vehicle.Also, a wheel will take certain rounds to cover some distance.Thus,Total distance covered by wheel = Number of rotations × circumference of wheel

$$\text{Number of rotations} = \frac{\text{Total distance to be coveredd by wheel}}{\text{Circumference of hte wheel}}$$

= 200

∴ The wheel will rotate 200 times.

17. The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour?
(Take $\pi = 3.14$)

Answer:

Length of minute of hand of clock = 15 cm

We have to find out that how far will the tip of minute hand move in 1 hour

For this we have to find out the distance travelled by the tip of minute hand

∴ Distance travelled by the minute hand in 1 hour = Circumference of the clock

We know that,

Circumference of the circle = $2\pi r$

$= 2 \times 3.14 \times 15$

$= 2 \times 15 \times 3.14$

$= 30 \times 3.14$

= 94.2 cm