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1. Find the circumference of the circle with the following radius. (Take π = 22/7)

(a) 14 cm

Solution:-

Given, the radius of the circle = 14 cm

Circumference of the circle = 2πr

= 2 × (22/7) × 14

= 2 × 22 × 2

= 88 cm

(b) 28 mm

Solution:-

Given, the radius of the circle = 28 mm

Circumference of the circle = 2πr

= 2 × (22/7) × 28

= 2 × 22 × 4

= 176 mm

(c) 21 cm

Solution:-

Given, the radius of the circle = 21 cm

Circumference of the circle = 2πr

= 2 × (22/7) × 21

= 2 × 22 × 3

= 132 cm

2. Find the area of the following circles, given that

(a) Radius = 14 mm (Take π = 22/7)

Solution:

Given, the radius of the circle = 14 mm

Then,

Area of the circle = $πr^2$

= $22/7 × 14^2$

= 22/7 × 196

= 22 × 28

= 616 mm^2

(b) Diameter = 49 m

Solution:

Given, the diameter of the circle (d) = 49 m

We know that radius (r) = d/2

= 49/2

= 24.5 m

Then,

Area of the circle = $πr^2$

= $22/7 × (24.5)^2$

= 22/7 × 600.25

= 22 × 85.75

= 1886.5 m^2

(c) Radius = 5 cm

Solution:

Given, the radius of the circle = 5 cm

Then,

Area of the circle = πr²

= 22/7 × 5²

= 22/7 × 25

= 550/7

= 78.57 cm²

3. If the circumference of a circular sheet is 154 m, find its radius. Also, find the area of the sheet. (Take π = 22/7)

Solution:-

From the question, it is given that

Circumference of the circle = 154 m

Then,

We know that the circumference of the circle = 2πr

154 = 2 × (22/7) × r

154 = 44/7 × r

r = (154 × 7)/44

r = (14 × 7)/4

r = (7 × 7)/2

r = 49/2

r = 24.5 m

Now,

Area of the circle = πr²

= 22/7 × (24.5)²

= 22/7 × 600.25

= 22 × 85.75

= 1886.5 m²

So, the radius of the circle is 24.5, and the area of the circle is 1886.5.

4. A gardener wants to fence a circular garden of diameter 21m. Find the length of the rope he needs to purchase, if he makes 2 rounds of the fence. Also, find the cost of the rope, if it costs ₹ 4 per meter. (Take π = 22/7)

Solution:-

From the question, it is given that

Diameter of the circular garden = 21 m

We know that radius (r) = d/2

= 21/2

= 10.5 m

Then,

Circumference of the circle = 2πr

= 2 × (22/7) × 10.5

= 462/7

= 66 m

So, the length of rope required = 2 × 66 = 132 m

Cost of 1 m rope = ₹ 4 [given]

Cost of 132 m rope = ₹ 4 × 132

= ₹ 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. (Take π = 3.14)

Solution:-

From the question, it is given that

Radius of circular sheet R = 4 cm

A circle of radius to be removed r = 3 cm

Then,

The area of the remaining sheet = $\pi R^2 - \pi r^2$

= $\pi (R^2 - r^2)$

= $3.14 (4^2 - 3^2)$

= $3.14 (16 - 9)$

= 3.14×7

= 21.98 cm²

So, the area of the remaining sheet is 21.98 cm².

6. Saima wants to put 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 meter of the lace costs ₹ 15. (Take π = 3.14)

Solution:-

From the question, it is given that

Diameter of the circular table = 1.5 m

We know that radius (r) = d/2

= 1.5/2

= 0.75 m

Then,

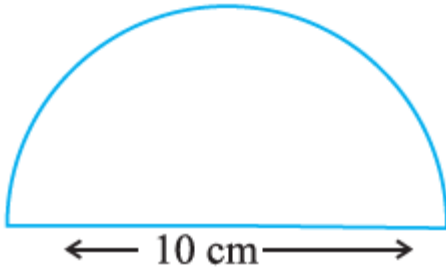Circumference of the circle = $2\pi r$

= 2 × 3.14 × 0.75

= 4.71 m

So, the length of the lace = 4.71 m

Cost of 1 m lace = ₹ 15 [given]

Cost of 4.71 m lace = ₹ 15 × 4.71

= ₹ 70.65

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

Solution:-

From the question, it is given that

Diameter of semi-circle = 10 cm

We know that radius (r) = d/2

= 10/2

= 5 cm

Then,

Circumference of the semi-circle = πr + 2r

= 3.14(5) + 2(5)

= 5 [3.14+ 2]

= 5 [5.14]

Therefore, the perimeter of the semicircle = 25.7 cm

8. Find the cost of polishing a circular table top of diameter 1.6 m, if the rate of polishing is ₹15/m². (Take π = 3.14)

Solution:-

From the question, it is given that

Diameter of the circular table-top = 1.6 m

We know that radius (r) = d/2

= 1.6/2

= 0.8 m

Then,

Area of the circular table-top = πr²

= 3.14 × 0.8^2

= 3.14 × 0.8 ×0.8

= 2.0096 m^2

Cost for polishing 1 m^2 area = ₹ 15 [given]

Cost for polishing 2.0096 m^2 area = ₹ 15 × 2.0096

= ₹ 30.144

Hence, the cost of polishing 2.0096 m^2 area is ₹ 30.144.

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? (Take π = 22/7)

Solution:-

From the question, it is given that

Length of wire that Shazli took =44 cm

Then,

If the wire is bent into a circle,

We know that the circumference of the circle = 2πr

44 = 2 × (22/7) × r

44 = 44/7 × r

(44 × 7)/44 = r

r = 7 cm

Area of the circle = πr^2

= 22/7 × 7^2

= 22/7 × 7 ×7

= 22 × 7

= 154 cm^2

Now,

If the wire is bent into a square,

The length of each side of the square = 44/4

= 11 cm

Area of the square = Length of the side of square²

= 11²

= 121 cm²

By comparing the two areas of the square and circle,

Clearly, the circle encloses more area.

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 1cm are removed. (As shown in the adjoining figure.) Find the area of the remaining sheet. (Take π = 22/7)

Solution:-

From the question, it is given that

Radius of the circular card sheet = 14 cm

Radius of the two small circles = 3.5 cm

Length of the rectangle = 3 cm

Breadth of the rectangle = 1 cm

First, we have to find out the area of the circular card sheet, two circles and the rectangle to find out the remaining area.

Now,

Area of the circular card sheet = πr²

= 22/7 × 14²

= 22/7 × 14 × 14

= 22 × 2 × 14

= 616 cm²

Area of the 2 small circles = 2 × πr²

= 2 × (22/7 × 3.5²)

= 2 × (22/7 × 3.5 × 3.5)

= 2 × ((22/7) × 12.25)

= 2 × 38.5

= 77 cm²

Area of the rectangle = Length × Breadth

= 3 × 1

= 3 cm²

Now,

The area of the remaining part = Card sheet area – (Area of two small circles + Rectangle area)

= 616 – (77 + 3)

= 616 – 80

= 536 cm²

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 leftover aluminium sheet? (Take π = 3.14)

Solution:-

From the question, it is given that

Radius of circle = 2 cm

Square sheet side = 6 cm

First, we have to find out the area of the square aluminium sheet and circle to find out the remaining area.

Now,

Area of the square = side²

= 6²

= 36 cm²

Area of the circle = πr²

= 3.14 × 2²

= 3.14 × 2 × 2

= 3.14 × 4

= 12.56 cm²

Now,

The area of the remaining part = Area of the aluminium square sheet – The area of the circle

= 36 – 12.56

= 23.44 cm²

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

Solution:-

From the question, it is given that

Circumference of a circle = 31.4 cm

We know that,

Circumference of a circle = 2πr

31.4 = 2 × 3.14 × r

31.4 = 6.28 × r

31.4/6.28 = r

r = 5 cm

Then,

Area of the circle = πr²

= 3.14 × 5²

= 3. 14 × 25

= 78.5 cm

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? (π = 3.14)
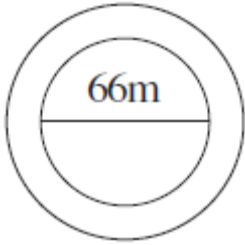
Solution:-

From the question, it is given that

Diameter of the flower bed = 66 m

Then,

Radius of the flower bed = d/2

= 66/2

= 33 m

Area of flower bed = πr^2

= 3.14 × 33^2

= 3.14 × 1089

= 3419.46 m

Now, we have to find the area of the flower bed and path together.

So, the radius of the flower bed and path together = 33 + 4 = 37 m

Area of the flower bed and path together = πr^2

= 3.14 × 37^2

= 3.14 × 1369

= 4298.66 m

Finally,

Area of the path = Area of the flower bed and path together – Area of the flower bed

= 4298.66 – 3419.46

= 879.20 m^2

**14. A circular flower garden has an area of 314 m². A sprinkler at the centre of the garden can cover
an area that has a radius of 12 m. Will the sprinkler water the entire garden? (Take π = 3.14)**

Solution:-

From the question, it is given that

Area of the circular flower garden = 314 m²

The sprinkler at the centre of the garden can cover an area that has a radius = 12 m

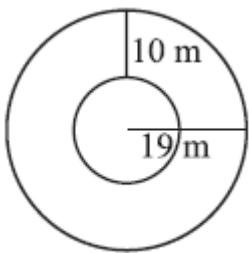Area of the circular flower garden = πr²

314 = 3.14 × r²

314/3.14 = r²

r² = 100

r = √100

r = 10 m

∴ Radius of the circular flower garden is 10 m.

The sprinkler can cover an area of a radius of 12 m.

Hence, the sprinkler will water the whole garden.

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

Solution:-

From the figure,

Radius of inner circle = outer circle radius – 10

= 19 – 10

= 9 m

Circumference of the inner circle = 2πr

= 2 × 3.14 × 9

= 56.52 m

Then,

Radius of outer circle = 19 m

Circumference of the outer circle = 2πr

= 2 × 3.14 × 19

= 119.32 m

16. How many times a wheel of radius 28 cm must rotate to go 352 m? (Take π = 22/7)

Solution:-

From the question, it is given that

Radius of the wheel = 28 cm

Circumference of the wheel = 2πr

= 2 × 22/7 × 28

= 2 × 22 × 4

= 176 cm

Now, we have to find the number of rotations of the wheel.

= Total distance to be covered/ Circumference of the wheel

= 352 m/176 cm

= 35200 cm/ 176 cm

= 200

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 π = 3.14)

Solution:-

From the question, it is given that

Length of the minute hand of the circular clock = 15 cm

Then,

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

= 2πr

= 2 × 3.14 × 15

= 94.2 cm