

Exercise 20.1

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**Question 1:** Find the curved surface area of a cone, if its slant height is 60 cm and the radius of its base is 21 cm.

Solution:

Slant height of cone ( $l$ ) = 60 cm

Radius of the base of the cone ( $r$ ) = 21 cm

Now,

Curved surface area of the right circular cone =  $\pi rl = 22/7 \times 21 \times 60 = 3960 \text{ cm}^2$

Therefore the curved surface area of the right circular cone is  $3960 \text{ cm}^2$

**Question 2:** The radius of a cone is 5cm and vertical height is 12cm. Find the area of the curved surface.

Solution:

Radius of cone ( $r$ ) = 5 cm

Height of cone ( $h$ ) = 12 cm

Find Slant Height of cone ( $l$ ):

We know,  $l^2 = r^2 + h^2$

$$l^2 = 5^2 + 12^2$$

$$l^2 = 25 + 144 = 169$$

$$\text{Or } l = 13 \text{ cm}$$

Now,

$$\text{C.S.A} = \pi rl = 3.14 \times 5 \times 13 = 204.28$$

Therefore, the curved surface area of the cone is  $204.28 \text{ cm}^2$

**Question 3 :** The radius of a cone is 7 cm and area of curved surface is  $176 \text{ cm}^2$  .Find the slant height.

**Solution:**

Radius of cone( $r$ ) = 7 cm

Curved surface area(C.S.A)=  $176 \text{ cm}^2$

We know, C.S.A. =  $\pi r l$

$$\Rightarrow \pi r l = 176$$

$$\Rightarrow \frac{22}{7} \times 7 \times l = 176$$

$$\text{or } l = 8$$

Therefore, slant height of the cone is 8 cm.

**Question 4:** The height of a cone 21 cm. Find the area of the base if the slant height is 28 cm.

**Solution:**

Height of cone( $h$ ) = 21 cm

Slant height of cone ( $l$ ) = 28 cm

We know that,  $l^2 = r^2 + h^2$

$$28^2 = r^2 + 21^2$$

$$r^2 = 28^2 - 21^2$$

$$\text{or } r = 7\sqrt{7} \text{ cm}$$

Now,

Area of the circular base =  $\pi r^2$

$$= \frac{22}{7} \times (7\sqrt{7})^2$$

$$= 1078$$

Therefore, area of the base is  $1078 \text{ cm}^2$ .

**Question 5: Find the total surface area of a right circular cone with radius 6 cm and height 8 cm.**

**Solution:**

Radius of cone ( $r$ ) = 6 cm

Height of cone ( $h$ ) = 8 cm

Total Surface area of the cone (T.S.A)=?

Find slant height of cone:

We know,  $l^2 = r^2 + h^2$

$$= 6^2 + 8^2$$

$$= 36 + 64$$

$$= 100$$

$$\text{or } l = 10 \text{ cm}$$

Now,

Total Surface area of the cone (T.S.A) = Curved surface area of cone + Area of circular base

$$= \pi r l + \pi r^2$$

$$= (22/7 \times 6 \times 10) + (22/7 \times 6 \times 6)$$

$$= 1320/7 + 792/7$$

$$= 301.71$$

Therefore, area of the base is  $301.71 \text{ cm}^2$ .

**Question 6: Find the curved surface area of a cone with base radius 5.25 cm and slant height 10 cm.**

**Solution:**

Base radius of the cone ( $r$ ) = 5.25 cm

Slant height of the cone ( $l$ ) = 10 cm

Curved surface area (C.S.A) =  $\pi r l$

$$= 22/7 \times 5.25 \times 10$$

$$= 165$$

Therefore, curved surface area of the cone is  $165 \text{ cm}^2$ .

**Question 7:** Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.

**Solution:**

Diameter of the cone( $d$ )=24 m

So, radius of the cone( $r$ )= diameter/ 2 = 24/2 m = 12m

Slant height of the cone( $l$ ) = 21 m

T.S.A = Curved surface area of cone + Area of circular base

$$= \pi r l + \pi r^2$$

$$= (22/7 \times 12 \times 21) + (22/7 \times 12 \times 12)$$

$$= 1244.57$$

Therefore, total surface area of the cone is 1244.57 m<sup>2</sup>.

**Question 8:** The area of the curved surface of a cone is  $60\pi$  cm<sup>2</sup>. If the slant height of the cone be 8 cm, find the radius of the base.

**Solution:**

Curved surface area(C.S.A)=  $60\pi$  cm<sup>2</sup>

Slant height of the cone( $l$ ) = 8 cm

We know, Curved surface area(C.S.A )= $\pi r l$

$$\Rightarrow \pi r l = 60\pi$$

$$\Rightarrow r \times 8 = 60$$

$$\text{or } r = 60/8 = 7.5$$

Therefore, radius of the base of the cone is 7.5 cm.

**Question 9:** The curved surface area of a cone is  $4070 \text{ cm}^2$  and diameter is  $70 \text{ cm}$ . What is its slant height? (Use  $\pi = 22/7$ )

**Solution:**

Diameter of the cone ( $d$ ) =  $70 \text{ cm}$

So, radius of the cone ( $r$ ) = diameter/2 =  $70/2 \text{ cm} = 35 \text{ cm}$

Curved surface area =  $4070 \text{ cm}^2$

Now,

We know, Curved surface area =  $\pi r l$

So,  $\pi r l = 4070$

By substituting the values, we get

$$22/7 \times 35 \times l = 4070$$

$$\text{or } l = 37$$

Therefore, slant height of cone is  $37 \text{ cm}$ .

**Question 10:** The radius and slant height of a cone are in the ratio  $4:7$ . If its curved surface area is  $792 \text{ cm}^2$ , find its radius. (Use  $\pi = 22/7$ )

**Solution:**

Curved surface area =  $792 \text{ cm}^2$

The radius and slant height of a cone are in the ratio  $4:7$  (Given)

Let  $4x$  be the radius and  $7x$  be the height of cone.

Now,

Curved surface area (C.S.A.) =  $\pi r l$

$$\text{So, } 22/7 \times (4x) \times (7x) = 792$$

$$\text{or } x^2 = 9$$

$$\text{or } x = 3$$

Therefore, Radius =  $4x = 4(3) \text{ cm} = 12 \text{ cm}$