

Solutions for Class 9 Maths Chapter 20 Surface Area and Volume of A Right Circular Cone

Exercise 20.1

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 = $\pi rl = \frac{22}{7} \times 21 \times 60 = 3960 \text{ cm}^2$

Therefore the curved surface area of the right circular cone is 3960 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,

$$\text{C.S.A} = \pi rl = 3.14 \times 5 \times 12 = 204.28$$

Therefore, the curved surface area of the cone is 204.28 cm^2

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Question 3 : The radius of a cone is 7 cm and area of curved surface is 176 cm^2 .Find the slant height.

Solution:

Radius of cone(r) = 7 cm

Curved surface area(C.S.A)= 176 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 = πr^2

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

$$= 1078$$

Therefore, area of the base is 1078 cm^2 .

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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

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

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

$$= 1320 + 7927$$

$$= 301.171$$

Therefore, area of the base is 301.71cm^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 165cm^2 .

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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 m².

Question 8: The area of the curved surface of a cone is 60π cm². If the slant height of the cone be 8 cm, find the radius of the base.

Solution:

Curved surface area(C.S.A)= 60π cm²

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.

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

Solution:

Diameter of the cone (d) = 70 cm

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

Curved surface area = 4070 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 cm .

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

Solution:

Curved surface area = 792 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 = $4x = 4(3) \text{ cm} = 12 \text{ cm}$